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Volume XIX May 1929 Number 5

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The Mortality Trend in the Industrial Population*

LOUIS I. DUBLIN, PH. D., FELLOW A. P. H. A.

Statistician, Metropolitan Life Insurance Company, New York, N. Y.

IN THIS paper is presented a summary of a report just completed on the mortality experience among 3¼ million white male wage earners insured in the Industrial Department of the Metropolitan Life Insurance Company. The study covered the 3-year period 1922 to 1924 inclusive, and is an exact parallel of one covering the 3-year period 1911 to 1913. Taken in conjunction with this earlier work, our present investigation makes available a picture of mortality probably unsurpassed in detail among American wage earners during the years when the movement for better industrial hygiene was being widely extended. It should be kept in mind that the industrial policy holders who formed the basis of the study consist of people in the United States and Canada who earn their livelihood in our manufacturing plants, mines, transportation industries and other mechanical pursuits. They constitute a fairly homogeneous social and economic group which may be described as the urban wage earning population.

The adult males of this class have a higher mortality and diminished longevity than those in other forms of employment. As is shown in Table I, the mortality rate for the group of insured males is higher than that of all males living in the U. S. Registration States in every age period from 25 to 64 years.

Curiously enough, the mortality rate of the insured group, at all ages combined, is lower than that of males in the registration states, being 11.8 and 13.8 per 1,000 respectively. This is due to lower mortality in the first age group—15 to 24 years—and in the last—65

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

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TABLE I

DEATH RATES PER 100,000 FOR ALL CAUSES OF DEATH
AGES 15 YEARS AND OVER
White Males
1923

Years of Age	15 and over	15 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 and over
United States Registration States	1,384.5	363.8	457.7	717.4	1,207.4	2,527.8	8,304.6
Metropolitan Industrial Dept.	1,183.5	347.2	556.1	946.6	1,725.4	3,385.3	7,574.7
Per Cent Insured of Population Death Rates	85.5	95.4	121.5	131.9	142.9	133.9	91.2

years and over. At age 25, the mortality rate of the insured is already higher and remains so up to age 64, increasing progressively from age 25 to 54 years. In the age period 45 to 54 years, the death rate for the insured exceeds that for the general population group by 43 per cent. In the succeeding age period—55 to 64 years—the rate is 34 per cent higher. These rates reflect the results of industrial exposure. In the beginning, the group of policy holders is in its best physical condition and has a lower mortality rate than the general population. At age 25, the situation changes; and thereafter, largely we believe as a result of industrial hazards, the mortality rate is heavier than that of the general male population. The last age period, where the insured again make a more favorable showing, is not reliable because most of our industrial policies terminate at age 74. It therefore follows that the average age of policy holders in the class 65 years of age and over is lower than that of the corresponding population group; and consequently, other things being equal, one would expect their mortality rate to be lower.

The effects of industry are also clearly revealed in the differential death rates for males and females of the same economic class. Comparing the death rates given in Table II for male policy holders and for their wives and sisters as represented by our female industrial policy holders, we find some striking differences. After age 10, the mortality rates for males are consistently higher than for females, with the single exception of the age period 15 to 24 years. Since the industrialization of women is then at its height, the question of the

TABLE II

DEATH RATES PER 100,000 FOR ALL CAUSES OF DEATH
AGES 10 YEARS AND OVER
METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT
1923

Years of Age	10 to 14	15 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 and over
White Males	198.6	347.2	556.1	946.6	1,725.4	3,385.3	7,574.7
White Females	162.4	353.3	491.9	677.9	1,188.0	2,576.1	6,726.7
Per Cent Male of Female	122.3	98.3	113.1	139.6	145.2	131.4	112.6

relative susceptibility of men and of women to the exactions of industry upon their health is definitely raised. After this age, the large majority of these women become housewives, and we notice a much lower rate of mortality for them in each succeeding age period than for men. This, we think, is largely traceable to the absence of industrial hazards in the life of most women.

Even more marked differences suggestive of the effects of industrial exposures are found when the mortality of industrial males is compared with that of persons who are for the most part engaged in non-hazardous pursuits. We may take, for this comparison, white male policy holders insured in the ordinary department of the Metropolitan Life Insurance Company, composed mainly of the clerical, professional, and commercial classes. Agricultural workers and the better paid mechanics are also represented in fairly large numbers. Age for age considered, the mortality rates for the industrial group run from one and one-half times to more than double the rates for those in the ordinary department. This is shown in Table III.

TABLE III

DEATH RATES PER 100,000 BY SPECIFIED AGE GROUPS FOR ALL CAUSES OF DEATH, 1923
REGULAR ORDINARY DEPARTMENT PREMIUM-PAYING BUSINESS (TOTAL MALES)
COMPARED WITH INDUSTRIAL DEPARTMENT PREMIUM-PAYING BUSINESS (WHITE MALES)

Years of Age	20 and over	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 and over
Industrial Males	1,404.1	400.6	556.1	946.6	1,725.4	3,385.3	7,574.7
Ordinary Males	550.0	255.2	268.4	422.0	790.1	1,868.0	5,604.1
Per Cent Industrial of Ordinary	255.3	157.0	207.2	224.3	218.4	181.2	135.2

In terms of life expectation, the severer status of the industrial worker is equally impressive. The industrial worker at age 20, when he begins his career, has an expectation of life of 42 years; or in other words he may expect to reach 62. The 20-year old worker engaged in non-hazardous occupations, however, may expect to attain age 69, or 7 years additional. Industrial workers are at a disadvantage in each succeeding period; at age 30 the difference is 6.6 years, at age 50, 4.2 years, and at age 70, 1.3 years, always in favor of the non-industrial group.

The above comparisons between the death rates of various groups —males insured in the industrial department of the Metropolitan, males of the registration states, males insured in the ordinary branch of the Metropolitan, and females of the wage earning class—show clearly the influence of industrial environment on mortality rates and life expectation. The difference in the mortality rates for these groups gives a rough measure of the tax which industrial work exacts,

and reflects the hazards to which workers are exposed. Other items obviously account for a part of the disparity in these figures. Heredity and innate differences play some part, but probably the most important factors are the conditions incidental to industrial employment including deleterious dusts, excessive fatigue, bad posture, crowded work rooms, dampness, extreme changes of temperature and sometimes specific occupational poisoning, to which industrial workers are so frequently exposed.

The health picture of the industrial worker is, however, far from discouraging when we consider the vast improvement which has taken place in recent years. Between 1912 and 1923 the death rate for our industrial group has declined from 1,621.7 per 100,000 to 1,183.5 per 100,000. Not only has there been a total decline of 27 per cent, but a substantial decline in the death rate has characterized every age group. On account of this reduced mortality, almost 14,000 fewer deaths have occurred among the 3¼ million policy holders in the single year of 1923 than would have taken place had the mortality rates of 1912 prevailed. This amounts in terms of life expectation to an average increase of 5 years for each industrial worker at age 20; and there has been some increase in longevity at every age period. The greatest reduction in mortality has taken place in the important working ages 25 to 34 and 35 to 44, when the rates declined 43.1 and 41.2 per cent respectively. Less progress is recorded after age 55, the decline amounting to only 16.4 per cent in the age period 55 to 64 years.

Turning now to a consideration of the specific diseases causing mortality among our working population, we find that almost every cause of death has shared in the highly gratifying downward trend of mortality.

Tuberculosis of the respiratory system, which in 1912 was the chief cause of death, has shown a very great improvement, the death rate declining from 319.9 per 100,000 in 1912 to 149.7 in 1923, a fall of 53.2 per cent. As a result, tuberculosis is now superseded by heart disease as the leading cause of death. Workers 25 to 34 years of age and 35 to 44 years were the most favorably affected, the decreases amounting to 60.2 and 62.6 per cent respectively. Nephritis has shown a significant though a smaller decrease of 38.0 per cent, the rates declining from 178.1 for all ages in 1912 to 110.5 in 1923. The mortality rate of this disease showed the greatest decline in the 35 to 44 age period where it went down 55.7 per cent. Mortality from pneumonia also showed a substantial reduction of 26 per cent, the rate in 1923 being only 92.5 per 100,000. The younger workers en-

joyed the greatest decline, the reduction amounting to 42.4 and 35.2 per cent respectively in the age periods 25 to 34 and 35 to 44. The fatal accident rate was reduced from 140.6 in 1912 to 121.2 in 1923, a decline of 13.8 per cent. Organic diseases of the heart showed little change at all ages. The death rate declined 7.5 per cent, or from 203.9 per 100,000 to 188.7. In the age period 35 to 44, however, the reduction amounted to 33.5 per cent.

Some of the lesser causes of death display a marked diminution, notably typhoid fever, cirrhosis of the liver and suicide, with decreases of 72.2, 65.4 and 42.2 per cent respectively. The effects of better industrial hygiene are clearly seen in the 50 per cent decline in the death rate from chronic lead poisoning, a disease almost exclusively occupational in origin.

Several exceptions to the general downward trend of mortality are to be noted. Cancer has increased in frequency, the death rate rising from 77.6 per 100,000 in 1912 to 94.9 in 1923, a rise of 22.3 per cent. In the important age periods 45 to 54 and 55 to 64, the rates increased 15.5 per cent and 30.6 per cent respectively. Influenza went up 157 per cent and automobile accidents almost 500 per cent at all ages. Diabetes and homicides registered increases, 13 and 18 per cent respectively for all ages. Cancer, influenza and automobile accidents increased at every age period; diabetes at every period after age 45; and homicides at every period except the 45 to 54 and 55 to 64.

TABLE IV

PER CENT DECLINE IN DEATH RATES AMONG WHITE MALES AND WHITE FEMALES INSURED IN INDUSTRIAL DEPARTMENT AND AMONG WHITE MALES OF THE REGISTRATION STATES OF 1910

	Metropolitan Life Insurance Company 1912 to 1923		Registration States 1911 to 1923
Age Group Years	White Males Per Cent	White Females Per Cent	White Males Per Cent
15 and older	27.0	21.1	3.5
15–24	26.0	21.1	19.3
25–34	43.1	27.5	29.0
35–44	41.2	28.2	23.2
45–54	26.3	17.5	15.7
55–64	16.4	13.7	6.1
65 years and older	13.4	12.1	+ 3.6

Those who are concerned with the health of the working population will be especially interested to observe that the death rate at every age has declined more rapidly for the industrial group than for others.

Table IV shows the percentage of decline in mortality of white males insured in our industrial department as compared with insured

white females and white males of the general population (U. S. Registration States of 1910).

Age for age considered, the decline in the death rates for our insured group has been from 7 to 18 per cent greater than the decline for males of the registration states; and from 1 to 16 per cent greater than for females of the industrial population. The greatest gain for all classes has been at the ages 25 to 34 and 35 to 44 years; and at these ages also the rate of decline for industrial males exceeds by the greatest margin the decline in the rates of the other classes. It would be very instructive if we could make similar comparisons between the trend in the death rates for individual causes of death for males of the registration states and for males insured in our industrial department. Unfortunately, the data necessary are not available. However, our figures, although incomplete, indicate that the decline in mortality among industrial males has been more rapid for all of the more important causes of death. This fact has been conclusively shown for tuberculosis in a recent study[1] on the declining tuberculosis death rate where it is pointed out that the maximum decline in the death rate from tuberculosis among industrial males between the years 1911 and 1925 occurred at the ages between 20 and 45 years and that at these ages the rate of decline was about 20 per cent greater among industrial males than among males in the general population.

It would be of the utmost value to our discussion if it were possible to present the facts for the trend of mortality among men engaged in specific occupations. We should then be able to learn whether all occupations were sharing in the improved conditions; what preventive measures had been productive of the greatest good; and where there was the greatest need for intensive future efforts. Incredible though it may seem, the number of occupations for which we have death rates covering a period of years in the United States is very small and the data do not lend themselves to ready interpretation. We did not have for our study the number of insured in each occupation; and for that reason, we cannot present death rates by occupation. We were, therefore, compelled to use the method of proportionate mortality, that is, to find out for each occupation the part that any cause of death played in the total mortality with due regard to age. While not as sensitive a measure as actual death rates, this method affords a fairly reliable indication of what the actual death rates for each cause would show. It is not feasible to present here the many instructive findings of this analysis. The facts for tuberculosis, however, are outstanding and are of especial interest to industrial hygienists.

Seventy-two occupational classes were investigated. Of these, all but 6 showed a lower percentage of deaths from tuberculosis in the period 1922 to 1924 than in 1911 to 1913. The occupations with the highest proportion of deaths from this cause were, in order: miners, underground—other than coal miners; pottery workers; stone cutters; waiters and hotel servants; cutlers and grinders; cigar makers and tobacco workers; laundry workers; compositors, printers, and pressmen; brass foundry workers; barbers and hair dressers; glass workers; and the clerical workers. There has been a decline in the percentage of deaths from tuberculosis for each of these occupations, except the miners (other than coal miners), since 1911–1913. Data are not available for individual groups of metal miners, such as gold and silver, lead and zinc, iron, etc.; but as a group, metal miners have shown, in more recent years, a higher ratio of deaths from tuberculosis than they did a decade or more ago. The increase is so slight that it is entirely possible that the actual tuberculosis death rate has decreased in this group, also. The apparent higher proportion of deaths from tuberculosis among miners may well be the result of greater reductions for the other major causes of death.

What factors have brought about this vast improvement in the health and longevity of industrial workers? Surely among the many causes must be included the wide expansion of workmen's compensation, preventive industrial medicine, the safety movement, the reduction in the hours of labor, elimination of the sweat-shop, better plant sanitation, the wider education of the workers regarding the dangers inherent in certain occupations, and the more intelligent care now taken to safeguard the health of workers, as contributory to this gratifying result. But even more important has been the improved standard of living which the increased prosperity of the American wage earner has provided. The outlook for the future is bright indeed. There is every reason to believe that the continuation and expansion of health activities in industry, noticeable everywhere, will result in further reductions in mortality. The trend in the death rate according to our recent figures is still downward. It is not unreasonable to expect, therefore, that in the not far distant future the mortality rates of industrial workers will approach, if they do not quite equal, those of the more favored classes of the population.

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Vitamins as Factors in Health and in Food Values II*

IN OUR report of last year,[1] attention was called to the fact that the so-called vitamin B had been shown to be of multiple nature, this one term having covered at least two nutritionally essential substances, one the long recognized antineuritic vitamin, the other more heat-stable and possessing what Goldberger has designated as a pellagra preventing property. While these "anti-disease" properties serve as convenient means of distinguishing the two factors and are, at least in some regions, also of very great intrinsic importance to the public health, yet it is no less important to recognize with equal clearness that both the substances perform essential functions in normal nutrition as well.

So recent is this differentiation of the former vitamin B that many of its phases remain to be worked out, so that their discussion at present would be more or less premature. Even terminology is still under discussion.

Miss Smith[2] has conveniently summarized much of the evidence for the existence of at least two essential factors, and the various designations which have been applied to them; and at our last meeting Dr. Eddy[3] reported quite fully upon certain phases of this interesting development of our knowledge of the vitamins, with special reference to recent progress in the study of the chemistry of the antineuritic substance, and the experimental differentiation of the other factor or factors through the current research work of himself and his associates.

These summaries and discussions are so recent and so readily available that it seems best to forego the traversing of the same ground in this report; but rather to devote the limited space available to the bearings of this new development upon the particular aspect of the matter with which this committee as such is immediately concerned, that is, these vitamins as factors in food values and in health.

In the matter of food values, it is plain that in future we must deal with two (or more) factors in considering that part of our nutritive requirement which in the past has been covered by the one term "vitamin B." How quickly and completely all statements, which in

* Report of the Committee on Nutritional Problems presented to the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

the past have been made in terms of vitamin B, now can and should be dismissed from our minds is a question of judgment and temperament which it is not our present purpose to debate. Much could be said, on the one hand, in favor of the prompt rejection of whatever is contaminated with misconception; and, on the other hand, in favor of conserving the results of the very considerable amount of good work which has already been recorded upon the vitamin B values of foods in so far as this can be done by well reasoned reinterpretation of soundly determined experimental facts.

Whatever position the individual student or teacher of food values may take in this connection, it is certain that references to the vitamin B of the past as a factor in food values cannot be expunged from the literature, and the question of their meaning will continue to be pertinent for some time to come.

Such tests for vitamin B values as have in the past been made by means of the prevention or cure of polyneuritis in pigeons are presumably indications of the antineuritic values of the materials thus tested.

But most workers have felt that the rat growth method yielded more uniform results, and so it has been more generally used in examining foods for vitamin B values. Foods which have been found by this method to have high vitamin B value, as the term has been understood in the past, may now be understood to be valuable sources of both the nutritional essentials now recognized as the antineuritic and antipellagric factors (since both are essential to growth); and such an item in our knowledge of food values seems even more significant now than before.

As both the antineuritic and antipellagric factors are essential to growth, paucity of either one would result in giving a food a low vitamin B value as hitherto tested by the rat growth method. Hence foods which have been reported as of low vitamin B value on the basis of such tests should now be tested quantitatively for each of the two factors separately; for such a food may be relatively richer in one than in the other.

This may also be true in the case of a food which is a good source of both. In fact, cases of outstanding excellence in each of the two directions have already been established. Whole wheat (and doubtless this will be found to be true of other cereals also) has been shown to be especially rich in antineuritic, and milk especially rich in antipellagric value. Each of these important foods is a good source of both factors, yet when eaten together they gain still further in nutritive value through their supplementary relationship to each other.

THE PELLAGRA PROBLEM

A more complicated situation confronts us when we turn to the consideration of the precise relationship of the antipellagric factor (the heat stable nutritional essential of the former vitamin B) to the theoretical and practical problem of the prevention of pellagra. We recognize the appropriateness of the term antipellagric in the sense that this factor undoubtedly tends to prevent the development of pellagra-like symptoms in experimental animals; but it seems probable that other substances (not necessarily closely related to this one in their chemical natures or normal nutritional functions) may also help to keep the body in a pellagra resisting state of health.

In this case more than one factor may be antipellagric, and no one substance may hold the same all-controlling relation to pellagra that the antineuritic substance appears to bear to beriberi.

Much evidence seems to support this view. In the first place, pellagra may not be so purely a deficiency disease as beriberi and scurvy now appear to be.

Jobling and others[4] have presented evidence which, while professedly somewhat tentative, seems much too significant to be ignored, to the effect that there is involved in pellagra an infectious agent which is able to establish itself in the human organism when the latter is malnourished through subsistence upon unbalanced diet.

Such a view of pellagra, as both an infectious and a nutritional disease, would place it in a category similar to that to which sprue is ordinarily assigned.

Tuberculosis is also a disease in which both infection and nutrition are involved, though here still other factors are known to be involved also, and the case *seems* distinctly different because the infectious agent is now well known. It is possible, however, that if we knew both cases better, the comparison of these two diseases might seem much more natural; and McCollum has advanced the idea that the all too frequent shortage of calcium and vitamin A in the diet is a common cause in rendering the body susceptible to either tuberculosis or pellagra, as the case may be.

A perhaps more familiar nutritional theory[5] has associated pellagra (or susceptibility to pellagra) with inadequacy in the kind or amount of food protein, such as to lead to a shortage of one or more of the essential amino acids which the proteins supply: and a few years ago some experimental evidence was reported from England which seemed to link the prevention and cure of pellagra-like conditions with the definite amino acid, tryptophan. So far as we know, this work has neither been confirmed nor explicitly refuted.

Important new evidence, however, now focuses our attention upon other nutritional factors.

The work of Goldberger and his associates[6] of the U. S. Public Health Service, in demonstrating that the heat-stable factor of the former vitamin B has the property of preventing a pellagra-like condition in the rat, has already been mentioned.

Simultaneously, Underhill and Mendel have shown that there is also a fat-soluble substance which prevents the development of a pellagra-like condition in the dog.[7]

In their second and very complete paper, Underhill and Mendel give full accounts of numerous experiments in which butter fat, egg yolk, carrots, or crystallized carotin has prevented or cured the pellagra-like condition of nutritional deficiency disease which Chittenden and Underhill discovered in 1917. We can make no better use of the necessarily limited time and space available for the consideration of this important work of Underhill and Mendel than to quote the summary with which they conclude their paper:

> When butter fat is fed to dogs suffering from the deficiency disease described by Chittenden and Underhill in 1917, these animals are quickly restored to a normal condition and may be maintained in health for prolonged periods.
>
> Under similar circumstances cod liver oil, known to contain active fat-soluble vitamin A, fails to restore these diseased dogs. Evidently this vitamin is not the potent factor in butter fat.
>
> The effective factor in butter fat is apparently quite labile for the potency is diminished by maintaining in cold storage during a period of 9 to 11 months.
>
> The presence of the potent factor in butter fat is associated with the color of the butter. As the color decreases the potency is diminished.
>
> Egg yolk contains the effective factor but is apparently less potent than butter fat.
>
> Boiled unpeeled carrots are even more effective in curative properties than is butter fat.
>
> Lard extracts the potent agent from carrots.
>
> It would appear that there is a direct relationship between the presence of carotinoids in the substances tested and the potent factor.
>
> Crystallized carotin in relatively small doses is capable of curing the diseased condition.
>
> Finally, these experiments lend support to the conception that naturally occurring pigmentary substances in foodstuffs play a rôle in nutritive processes.

This is plainly a factor not previously recognized. Its properties seem so different as to make it unlikely that there is any close relationship between this substance and the water soluble, heat-stable antipellagric vitamin of Goldberger. Does this mean that a deficiency of either of these two different and apparently unrelated substances may be the determining factor in pellagra?

It would, in our judgment, be unprofitable to press this question of theoretical interpretation at present, because there are still discrepancies to be cleared up as to the empirical facts regarding prevention of pellagra by different articles of food. Butter and carrots are much more favorably reported from New Haven than from Washington—in fact, regarding carrots, Underhill and Mendel say: "The discrepancies between the results of Goldberger and his associates and our own are so great as to prohibit attempts at explanation." And, on the other hand, the U. S. Public Health Service appears to attribute greater pellagra preventing value to wheat germ than is consistent with the findings of other laboratories.

But dietary means for the practical prevention of pellagra are now well known. In the mill village region of western South Carolina, where pellagra was extremely prevalent a dozen years ago and is now so greatly reduced as to be chiefly a memory, though still a threatening one, everybody, from the best educated to the most unlettered, refers confidently to "balanced diet" as the sovereign remedy and preventive.

Among the somewhat diverse impressions as to particular articles or types of food (for in most cases the diet has been enriched in several ways at once), there is such a general consensus of opinion that dairy products are especially effective, that in parts of the South the Red Cross is reported to be combating pellagra by the lending of cows—an excellent educational device, but not to be taken as meaning that physical proximity of cow and patient is essential, for milk contains the needed factor or factors in sufficiently stable form so that the cow can function at any distance that may be economically convenient.

Unanimity of opinion that milk is of high pellagra preventive value is equally consistent with any of the nutritional theories, because milk contains all the nutritionally essential factors, and is an outstandingly valuable source of nearly all of them.

But, as already suggested, this practical dietary means of combating pellagra is well known. Hence the somewhat confusing and apparently complex situation which confronts us as to the theoretical explanation of pellagra prevention need not retard the actual control of the disease, while the research which is needed for the clearing up of the theoretical problem may well be expected to add to our knowledge of the chemistry of normal nutrition and ultimately contribute to a still fuller understanding of the scientific foundations of positive health.

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Sanitary Etiquette

THE U. S. Public Health Service has coined this name, which should come into general use. It carries a significance which everyone will recognize. Coughing and sneezing without protecting the mouth, indiscriminate kissing, insistence upon shaking hands, blowing the nose on a dirty handkerchief used later for some other purpose, and many similar practices which are too common, represent "unhygienic manners." The same is true of moistening various articles such as money, books, tickets, etc., with saliva.

The essence of good manners is consideration for others, and this applies to social customs as to hygiene. The Service suggests the writing of a book, "The Hygiene of Etiquette," and hopes that it will teach prophylactic manners and practical hygiene as well as social courtesy.

MINNEAPOLIS MUNICIPAL AUDITORIUM

Health Education in Illinois Teachers' Colleges*

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THE problem of health education in a college for teachers is a triple one, concerned first, with the personal health of the students, second, with the selection of subject matter, and third, with methods in health teaching.

The American Public Health Association poster entitled "Milestones of Public Health" gives the date, 1918, as the beginning of school health education. James F. Rogers, M.D., Chief of the Division of Physical Education and School Hygiene, U. S. Bureau of Education, makes a similar statement.[1] Whether or not we concur in this statement, we do know that since the year 1918 the term "health education" has almost entirely replaced the older one of "physiology" or "physiology and hygiene."

This paper will deal with health education in the Illinois teachers' colleges since the World War and the possibilities for the program of the future. During the post-war period two of the schools each added a physician to their staffs and one a nurse, and all the teachers of physiology placed more emphasis on health habits and methods of health habit training in the elementary school than before.

It was not until 1925, however, that a united effort was made to consider the health programs in the Illinois teachers' colleges and to suggest future policies. A survey of public health service in fifteen Illinois cities[2] was made by the Illinois Department of Public Health, with the guidance of Thomas G. Perrin, M.D., of the U. S. Public Health Service. This survey showed that the public health service in these cities was far from the standard set by the A. P. H. A. *Appraisal Form for City Health Work*. Of a possible 100 per cent of service, only 1 city was receiving as much as 80 per cent, and 6 cities were receiving less than 50 per cent. The survey showed inadequate expenditures for fundamental health services as well as inadequate

* Read before the Public Health Education Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

service—both the result of lack of information and appreciation on the part of the community. Education loomed large as the best possible means of stimulating public opinion in relation to these health services.

In order to find efficient educational channels, the advisory committee of the Illinois Department of Public Health in coöperation with representatives from the state teachers' colleges made a study of the health programs in these institutions in an effort to recommend measures for their stimulation and improvement. As a result of the work of this joint committee, a plan was drafted for training student teachers in personal and public health. Later this plan was submitted to and endorsed by the Illinois State Department of Public Health, the Illinois Normal School Board, and the presidents and faculties of the teachers' colleges. The special features of this original plan were: (1) health examinations and professional health service for all students, (2) proper living conditions for all students, (3) a required course in personal and public health, to be known as health education, and (4) additional required health courses for all 4-year students.

This brings us to the question—what are the results of this united effort to meet the present health education problems in the teachers' colleges?

HEALTH EXAMINATIONS

Prior to September, 1926, examinations had been given regularly only in 2 of the colleges where resident physicians were in charge. In the two years since that date all 5 colleges have required their entering students to be examined. Physicians from the State Department of Public Health have assisted several of the colleges in making these examinations, but for the most part the college physicians and local physicians have had this responsibility.

In 1 college which has no staff physician, the resident nurse, cooperating with the physical training department, conducts the examinations with the help of local physicians, dentists, and nurses. In the other 2 colleges the physical training department supervises the examinations. One college has added a nurse to its health service staff, but thus far this is the only one having both a resident physician and a nurse. As yet, 2 of the smaller colleges have neither.

One of the problems in connection with health examinations is that of records and record forms. The desirability of uniform blanks for this purpose has been discussed by the various persons in charge of the examinations, but a form satisfactory for general use in all 5 colleges has not been prepared. Further study is needed on this subject.

The matter of advising students in regard to correctable defects and considering health records in connection with professional ratings is difficult to handle in those colleges which have no resident physician. Much of the value of the examination is lost if time does not permit the physician to consider the findings with the student. Serious deficiencies of eye, ear or throat are usually referred for correction to the family physician, but the minor defects, which are a slow but certain drain on future vitality, are ignored for want of time unless the resident physician or nurse can arrange for a later conference.

The possibility of a student health council for stimulating personal responsibility in this connection has been suggested. Dr. Bailey's plan for a health councillor[3] might also meet this need. A few nurses, some physical training, and some health teachers are well fitted, because of their broad training, to serve as councillors in this field. The failure to have a resident physician or nurse as councillor is fundamentally due to lack of finances. The need of their services for the student group is recognized. The next step consists in recognizing it as of sufficient importance to overcome the financial difficulty.

The health examination prior to graduation will be as general as the entrance health examination only when the college staffs include both the physician and nurse.

The professional health service suggested in the plan included such features as hospital care, visiting nurse service and control of contagion. This last has always received more or less attention in all of the teachers' colleges, but the hospital care and visiting nurse service are of necessity limited because the professional health staff is limited. The time will doubtless come when the prospective student and his guardians will inquire as carefully concerning the health service offered by a school as they now inquire regarding its courses, professors, degrees, and social life. At the present time, however, a study of the catalogs of our 5 Illinois teachers' colleges shows that they give practically no information of this sort.

PROPER LIVING CONDITIONS

Each college has an excellent dormitory, but these house only a comparatively few of the women students. In the past, faculty committees and the deans have given considerable time and thought to the off campus students. The new plan, however, has stimulated new interest in and control of student living conditions. All householders who wish to furnish board or room to students are registered at the college. The houses on the approved list must meet certain requirements regarding heating, lighting, and ventilation, toilet and bath

facilities, screening, size of rooms, and control of communicable diseases. An extensive and excellent study of student housing conditions was recently made in 1 college, and special attention has been given the subject in each of the others. The question of uniform blanks for recording housing conditions has been discussed at the annual meeting of the teachers' college faculties. It should receive further consideration.

HEALTH EDUCATION COURSES

The health education course which was recommended in the plan for the teachers' colleges was the result of the findings in the survey of fifteen Illinois cities,[2] which pointed to the need for more general information regarding public health services.

The 5 teachers' colleges have always offered courses in physiology and sanitation which emphasized to a greater or less degree the problems of personal and public health. The object of the plan in this, as in other respects, was to arouse new interest in this field of education. To this end the new title, "health education," was suggested and this has been generally adopted. This course in health education was recommended as a minimum requirement for all 2-year students, and the teachers' college catalogs show that such is now the case. As a required part of this course the inspection of sanitary conditions within the local college community was suggested, which may include the homes or dormitories, school buildings, eating places, markets, dairies, and local health departments. In connection with the inspection of sanitary school buildings the *School Health Appraisal Form*, sponsored by the Illinois Congress of Parents and Teachers and the Division of Child Hygiene, State Department of Health, will be available during the present school year.

It was further recommended that all students engaged in supervised teaching at the time they are enrolled in the health education course be given a survey assignment in the training school. The report of this survey should include the sanitary care of the classroom and its equipment; the sickness, absence, and contagion rates of the training school pupils; and the health habits taught to the pupils. This part of the plan has not been generally emphasized. The *School Health Appraisal Form* should help to promote this type of inspection since it helps to state standards and also to check results.

A second feature suggested for the health education course is the scoring of the student's own health habits. As yet this feature of the plan has not been extensively used. At least two instructors in this course have had students check their practices in regard to the different health problems, as these are considered in the regular class work.

Usually these personal scores have been unsigned and have not been considered in making the individual's academic record. There has been considerable discussion among health education specialists concerning the grading of personal health-habit scores. If good teaching can develop well balanced appreciation and interest in health practices, it would seem wise to emphasize the personal rather than the academic value of these records. The use of the individual health inventory as reported in other schools seems to indicate that it is most valuable when personally discussed with the faculty adviser or when its use is sponsored by a student organization. The work of arranging a general score card for personal health practices is still before our instructors of health education.

The recommended plan suggested further, that students in the health education classes make a study of the health or hygiene textbooks officially used in the elementary and high schools of Illinois. The aim to train students to discriminate as to the presentation, the pedagogic correctness, and the scientific accuracy of this class of books has been generally included in this course. The instructors in 3 of the colleges have directed their students in making collections of health education books and other materials and evaluating their usefulness. Recently the School Health Education Service of the State Department of Public Health arranged an exhibit of such materials which it loaned to 3 of the colleges during their summer school sessions. This feature of the course can profitably be extended in the future.

Reference books to be supplied by the libraries for students in the health education courses were recommended as to type but not by title. In all of the colleges these have been supplied and for the most part generously. The question of a textbook for the course could not, according to the Illinois law, be decided by the committee. However, certain requirements were stated but thus far no one book has been found which satisfactorily meets them all. Government and other bulletins which deal with personal and public health have been used to overcome this difficulty.

ADDITIONAL REQUIRED HEALTH COURSES

The plan recommended that an advanced health course be required of every student enrolled in a 4-year curriculum. For the most part such advanced courses have been neither offered nor required. A few exceptions occur in connection with the courses in home economics, physical training, and high school methods, which offer home nursing, corrective exercises, and adolescent or mental hy-

giene problems, respectively. Health programs of college rank tend to begin and end with elementary or single term health education courses. Thomas A. Storey, M.D., indicated this in his report, *The Status of Hygiene Programs in Institutions of Higher Education in the United States,*[4] and Emma Dolfinger warned us against this danger in her address given at Atlantic City in 1926.[5] If we are to have adequate health programs in our public schools in the future, we must have superintendents, principals and teachers who are adequately trained in this field.

In Dr. Storey's report he made a very definite plea for developing a civic attitude toward health education, and he deplored the fact that the educational aspect of administrative hygiene programs is almost completely ignored. In the teachers' colleges some first-hand experience with the administrative problems of heating, lighting, water supply, sanitary care of school buildings and control of communicable diseases would certainly be invaluable to prospective superintendents and principals. The fact that reports from 2 of the Illinois teachers' colleges were included in Dr. Storey's study indicates that along with other schools throughout the country we have failed to utilize some of our own best opportunities.

According to the standards set by Dr. Storey's study, we also fail in extensively coördinating the various parts of the health program. This, he claims, must result in more or less duplication of effort and in less effective programs than could be expected from extensive cooperation. The Illinois teachers' colleges are no exception to this claim. An opportunity for considering the value of increasing all health education activities in the teachers' colleges is offered in connection with the annual meeting of the 5 faculties. During the past year a session of their program was devoted to "Health Education Problems in the Teachers' Colleges." The staff members from the departments of health service, biology and hygiene, physical education, and home economics were all present. The interest in the general discussions assured the success of plans for future meetings. It also helped to assure the success of health programs for Illinois teachers' colleges.

SUMMARY

The teachers' colleges in Illinois have been stimulated in their health programs not only by the physical records of World War recruits, but even more effectively by the findings of the survey made in fifteen Illinois cities. The plan for a health program which was recommended to and adopted by the teachers' colleges in 1925 has increased their activities so that (1) health examinations are, at pres-

ent, the rule rather than the exception; (2) efforts to require good living conditions for *all* students and to inspect them regularly have been increased or stimulated; and (3) the health education course required of all students emphasizes the value and the standards for public health service, the requirements for an effective public school health program, and the importance of personal health practices.

An increasingly effective health program in the future probably depends on (1) adding a physician and a nurse to the resident staff of each college where these are not now included; (2) increasing the number of advanced courses in health education and the opportunities for studying the administrative health problems of the training school, especially for prospective superintendents, principals, and special teachers of health instruction; and (3) on continuing the coöperative efforts of the various departments concerned with the health program in the Illinois teachers' colleges.

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Communicability of Pneumonia

IT IS nearly 100 years since Dr. Samuel Henry Dickson, of Charleston, S. C., insisted upon the communicability of pneumonia, some 15 years before Pasteur began his experiments which founded the science of bacteriology.

All physicians of experience have observed instances in which the contagiousness of pneumonia could hardly be questioned. The New York City Department of Health during a 6-months period has studied 8,767 cases of pneumonia of which only 18 were secondary.

In view of the unquestioned fact that many pneumonias are due to specific germs, this small number of cases is rather surprising.

Probably other factors are also concerned, such as increased susceptibility. However, the fact that pneumonia is possibly communicable must not be lost sight of.—*Weekly Bull.*, New York City Dept. of Health, Mar. 9, 1929.

The Correction of Infant Mortality Rates for Residence

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THE death rate among children under 1 year of age is generally considered peculiarly sensitive to sanitary and other environmental factors. For this reason, infant mortality rates are under constant scrutiny wherever health work is being carried on, and their accuracy is of more than ordinary importance. To persons who are in close touch with the infant mortality statistics for any specific community it is a recognized fact that the officially recorded death rates do not always give a fair representation of local conditions, since the practice of using the number of births in the area as that of the infant population, and of relating to this population all deaths under 1 year of age within the area, without regard for the actual residence of the mother or infant, may result in a death rate which is not typical of the *resident* infant population. There are other inaccuracies in the records of infant mortality; but this paper is to discuss only those due to this reason.

Several conditions, of increasing importance, are involved. The modern trend toward hospitalization of maternity cases is bringing into cities with hospital facilities more and more mothers who are residents of rural communities and villages, with the result that the births recorded do not represent the infant population of the cities, nor of the surrounding districts. Deaths among these non-resident infants are not charged to the locality where the birth was recorded unless the death takes place before removal from the hospital. It might be expected that this would tend to lower the infant death rate in the communities with large numbers of non-resident births and to raise it in those from which these births were drawn. However, this result may be more than offset by other factors: (1) a high death rate in early infancy among the non-resident infants because of a comparatively large proportion of confinements having complications among those seeking hospital care; (2) deaths in the hospitals of non-resident infants brought for treatment after birth, thereby removing them from the locality to which the death should be ascribed and adding them to another. Obviously, to obtain an infant death rate which is repre-

sentative of a specific community, the two factors, births and deaths under 1 year of age, must be so refined that they apply to this community and also have a true relationship one to the other.

For an urban locality with good hospital facilities, the exclusion of births to non-resident mothers and of deaths of all non-resident infants will usually give a satisfactory resident rate, since the numbers of resident births or deaths which occur away from such a city are too few to materially affect any total rate. But for a rural community whose residents must seek hospital care in the nearest or most accessible cities, it becomes necessary to determine the number of births to resident mothers and also the deaths of resident infants which were registered in other places. The former method of refinement, the exclusion of non-residents, is relatively easy, but the search for births and deaths belonging to a specific community among those registered in many other communities is both time consuming and expensive. So far as is known to the writer, no study of infant mortality in a rural area has been published in which the death rate has been refined both by the exclusion of non-resident births and infant deaths and by the allocation to the area of resident births and deaths recorded elsewhere.

For Cattaraugus County, N. Y., such a refinement of the infant death rate for residence was undertaken and the results are here presented. The county has been coöperating in a rural health demonstration since 1923. It is in the southwestern corner of New York and had a population of about 73,816 in 1925, of which approximately 60 per cent was rural. The largest city is Olean (population 21,345), near Pennsylvania to the south and Allegany County to the east. The hospitals in Olean serve many residents of Pennsylvania and of Allegany County as well as those of Cattaraugus County. Salamanca (population 9,978), with one small hospital, provides care for a certain number of nearby rural residents. Residents of the northern and western parts of the county find Buffalo and Jamestown much more accessible than Olean, and some in the southern districts go to Bradford, Pa. Clearly, the problem of determining the death rate among resident infants in Cattaraugus is a dual one—not only must non-residents be excluded but the resident births and infant deaths in other areas must be considered. In this respect Cattaraugus County is in no way unique, as arbitrary political boundaries are meaningless so far as delimiting an integrated community.

In this study the recorded infant mortality rates are compared with two corrected rates: (1) that obtained by the method of excluding non-residents in the years 1921 to 1927, and (2) that obtained by allocation to the county of births and deaths under 1 year of age

TABLE I

NUMBER OF BIRTHS RECORDED IN CATTARAUGUS COUNTY AND IN THE URBAN AND RURAL SECTIONS COMPARED WITH THE NUMBER TO RESIDENT MOTHERS

Year	Total County			Urban			Rural		
	Total Number Recorded	Births in County to Resident Mothers	Total Resident Births*	Total Number Recorded	Births in County to Resident Mothers†	Total Resident Births*	Total Number Recorded	Births in County to Resident Mothers†	Total Resident Births*
1921	1,652	1,588	—	831	733	—	821	855	—
1922	1,578	1,535	—	773	675	—	805	860	—
1923	1,442	1,396	—	728	636	—	714	760	—
1924	1,474	1,412	—	762	645	—	712	767	—
1925	1,425	1,355	1,412	781	637	649	644	718	763
1926	1,417	1,318	1,374	816	633	643	601	685	731
1927	1,424	1,314	1,357	817	625	630	607	689	727

* Includes births to resident mothers recorded in adjoining areas.

† Number of recorded births to mothers not residents of the county were deducted and all births in the county allocated according to the place of usual residence of the mother.

which were registered outside, in addition to excluding non-residents, in the years 1925, 1926 and 1927. By the first method are excluded not only the non-resident births and deaths under 1 year but also the deaths of resident infants whose births were registered outside the county. The result is a death rate among resident infants born in the county. By the second method only non-residents are excluded and those resident infants born outside are added to the population together with deaths among this group which occurred elsewhere than in Cattaraugus County, the result being a death rate for the total infant population of Cattaraugus County. The first rate has the advantage of being easily derived from the data on the birth and death certificates registered in the county, while the second is more accurate, being free from the possible effect of excluding a selected group of infants.

The importance of making these refinements according to residence is considered in relation to the effect upon (1) the total infant death rate for the county, (2) the death rate from specific causes for the county, (3) the total death rate for the urban and rural parts of the county, and (4) the death rate from specific causes for the urban and rural parts of the county.

Only the areas adjoining Cattaraugus County have been considered as likely to have been the birthplace of any considerable number of Cattaraugus infants. These include Chautauqua, Erie, Wyoming and Allegany Counties, N. Y., and Bradford, Pa., to the south as shown in Figure I. All birth certificates from each of these

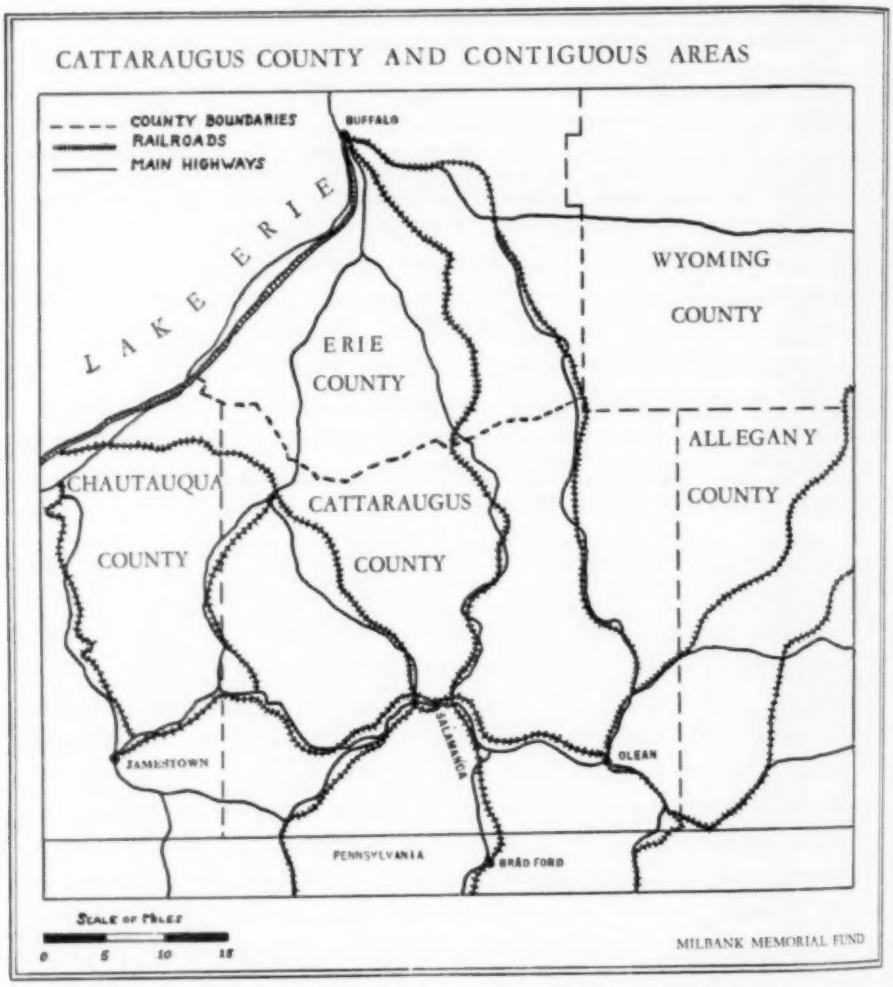

FIGURE 1—Map showing accessibility by railways and highways of Cattaraugus County to neighboring cities and of neighboring rural districts to Cattaraugus County cities.

counties in 1925, 1926 and 1927,* filed with the State Registrar of Vital Statistics, were examined to find any births to mothers who were residents of Cattaraugus County, and the number of births to Cattaraugus County mothers recorded in Bradford, Pa., were obtained from the registrar of that city. The number of births recorded in Cattaraugus County, the number after excluding births to non-resident

* This part of the study was limited to 3 years because of the time involved. Approximately 19,000 birth certificates were scanned for residence of mother for each year.

TABLE II

RECORDED AND RESIDENT DEATHS UNDER ONE YEAR OF AGE FOR CATTARAUGUS COUNTY, 1921–1927

Year	Total Recorded in Co.	Non-resident Deaths Recorded in County		Recorded Deaths of Residents Born outside Co.*	Deaths among Residents Born in County	Deaths outside Co. among Res. Born outside	Net Resident Deaths
		Born in County	Born outside County				
1921	129	7	0	3	119	?	—
1922	145	2	2	4	137	?	—
1923	130	1	4	2	123	?	—
1924	97	4	2	3	88	?	—
1925	102	2	3	0	97	2	99
1926	95	7	1	2	85	1	88
1927	86	8	3	3	72	1	76

* Decedent has been counted as a resident unless information available definitely established the residence as outside the county at the time of death.

mothers, and the total number of resident births after adding those found in the adjoining areas are shown in Table I.*

The number of deaths under 1 year of age registered in the county is shown in Table II. The non-resident deaths and those of resident infants born outside the county, and not counted in the population under 1 year of age, are also given. Difficulty was experienced in classifying a few infants born outside the county from the data on the death certificate, but they have been counted as residents unless the information established the residence as outside the county at the time of death.† To obtain the mortality among the births to resident mothers which occurred outside the county, the names of the infants registered in adjoining counties of New York were checked against the index of all deaths reported to the State Department of Health. No check on the mortality among the births which occurred in Bradford, Pa. (8 or 9 annually), was made. Only 2 deaths in 1925, 1 in 1926 and 1 in 1927 were found to have occurred among these infants before they returned to Cattaraugus County.‡

On the basis of the data in Tables I and II, it is possible to compute the two corrected rates for the county; i.e., the death rate among

* See Downes, Jean. The Accuracy of the Recorded Birth Rates in Urban and Rural Areas, *J. Am. Stat. Ass.*, Mar., 1929, for further details as to the allocation of births and the effect on the birth rate.

† This practice was followed because these deaths occurred apparently from conditions contracted in the county and to balance any deaths outside the county of resident infants who changed their residence during the first year of life.

‡ As the total births to resident mothers in 1925, 1926 and 1927 registered in adjoining New York counties numbered 140, the 4 deaths among this group would give approximately the death rate in the first week of life among residents born in the county, which varied from 3 to 4 per 100 in the years 1921 to 1927.

TABLE III

INFANT MORTALITY RATE AS RECORDED IN CATTARAUGUS COUNTY COMPARED WITH THE MORTALITY RATE AMONG RESIDENT INFANTS, 1921–1927

Year	Deaths under One Year per 1,000 Live Births			Percentage Difference from Recorded Rate	
	Recorded	Residents Born in County	Total Known Residents	Residents Born in County	Total Residents
1921	78.1	74.9	—	−4.1	—
1922	91.9	89.3	—	−2.8	—
1923	90.2	88.1	—	−2.3	—
1924	65.8	62.5	—	−5.3	—
1925	71.5	71.6	70.1	+0.1	−2.0
1926	67.0	64.5	64.0	−3.7	−4.5
1927	60.4	54.8	56.0	−9.3	−7.3

resident infants born in the county and for all known resident births. These are compared in Table III with the annual rates based on the registered births and deaths.

From 1921 to 1927, the resident death rate for infants born in the county was lower than the gross registered rate in every year except 1925. The difference is not great, 5 per cent or less in every year but 1927 when it was 9 per cent, but the influence of the non-resident mortality has been consistently unfavorable to the Cattaraugus County rate. In 1927, exclusion of non-residents lowers the rate enough to increase materially the indicated decline over the 1926 infant mortality, and is important because it suggests an increasing effect of the non-residents on the county rate.

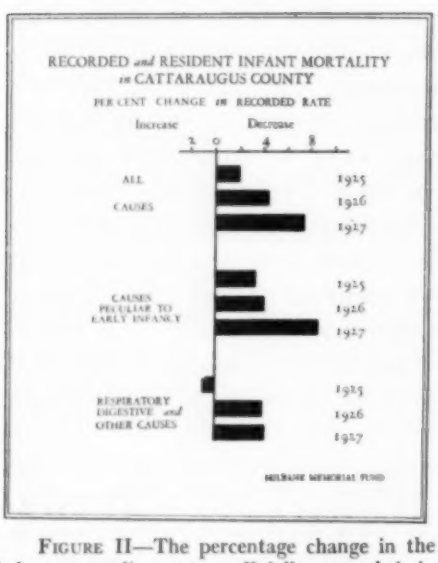

FIGURE II—The percentage change in the infant mortality rates officially recorded in Cattaraugus County resulting from correction for residence in 1925, 1926 and 1927.

The total resident death rate for children under 1 year of age also was lower than the crude registered rate for each of the years 1925, 1926 and 1927. The percentage difference between these and the recorded rate is shown in Figure II. The total resident rate differed scarcely at all from the death rate obtained for the residents born in the county in 1926; was a little lower in 1925; and a little higher in

1927. The infants born away from the county were less than 5 per cent of the total births to residents, and since the mortality among them was not high, the inclusion of these and the deaths among them does not affect the resident death rate so much as the exclusion of the non-resident births and deaths affects the registered rate.

A high mortality among the non-resident births in the county during the first few days of life is suggested by the fact that a reduction in the death rate results when the non-resident births and deaths are excluded. The mortality during the first week of life * among the non-resident births is compared in Table IV with the mortality among

TABLE IV

DEATH RATE IN THE FIRST WEEK OF LIFE AMONG NON-RESIDENT INFANTS BORN AT OLEAN COMPARED WITH THE RATE FOR RESIDENTS OF CATTARAUGUS COUNTY BORN IN THE COUNTY, 1921–1927

Year	Residents Born in County			Non-residents Born at Olean		
	Number of Live Births	Deaths under One Week	Rate per 1,000	Number of Live Births	Deaths under One Week	Rate per 1,000
1921	1,588	57	35.9	43	7*	162.8
1922	1,535	59	38.4	31	2	64.7
1923	1,396	63	45.1	36	1	27.8
1924	1,412	50	35.4	51	3	58.8
1925	1,355	57	42.1	57	2	35.1
1926	1,318	47	35.6	86	5	58.2
1927	1,314	38	28.9	94	8	85.1
1921–27	9,918	371	37.4	398	28	70.4

* Including two infants dying on the 8th day.

the resident births. Since all the non-resident deaths occurred at Olean, the rates have been computed on non-resident births in Olean. Although the mortality among the non-resident births fluctuated widely from year to year, it is clear that the death rate in the first week of life was higher than that among resident births, the average for the 7 years being nearly twice as high. This higher death rate in early infancy among the non-resident births is explained by the fact that they are a selected group which includes a large proportion of maternity cases for which some complication of confinement was expected.

The deaths which occurred among the non-resident births before removal from the county resulted for the most part from premature

* Few deaths occurred among the non-resident births after the first week; in 1921, 2 infants died at the age of 8 days; in 1924, 1 died at the age of 16 days; and in 1926, 1 died at 16 days and one at 11 months, the latter infant obviously having been brought to the hospital a second time for treatment.

birth, injury at birth or some congenital cause. It is to be expected that their exclusion will have a greater effect on the death rates from these specific causes than on the total infant mortality rate. The infant death rate from the general group of " early infancy " causes as registered in the county is compared in Table V with the rate for the resident infants born in the county and for the total known resident infant population. From 1925 to 1927, the " early infancy " mortality among all resident infants was lower than the registered rate, and the difference increased from 3.3 per cent in 1925, to 8.5 per cent in 1927, as is shown in Figure II.

The " early infancy " mortality rate for resident infants born in the county was also lower than the recorded rate. It differed only slightly from the total resident rate, and, being available back to 1921, it further indicates that non-resident deaths have had an increasing effect on the recorded mortality from " early infancy " causes.

The corrected infant death rates from all causes other than those " peculiar to early infancy " also are compared with the registered rates in Table V. These deaths are due chiefly to communicable, respiratory and gastrointestinal diseases. As deaths from these causes rarely occur in the first few weeks of life, and no death was reported

TABLE V

RECORDED AND RESIDENT INFANT MORTALITY BY TWO BROAD GROUPS OF CAUSES IN CATTARAUGUS COUNTY AND PERCENTAGE CHANGE IN RESIDENT RATE FROM RECORDED RATE, 1921–1927

Year	Malformations, Premature Birth and All Other Causes Peculiar to Early Infancy			Respiratory, Gastrointestinal, Communicable Diseases and All Other Causes		
	Recorded	Residents Born in County	Total Resident Infants	Recorded	Residents Born in County	Total Resident Infants
Deaths under One Year per 1,000 Live Births						
1921	43.0	40.9	—	35.1	34.0	35.2
1922	53.9	54.1	—	38.0	35.2	36.8
1923	49.9	50.1	—	40.2	38.0	38.3
1924	43.4	41.8	—	22.4	20.5	21.2
1925	49.1	48.0	47.5	22.5	23.6	22.7
1926	49.4	48.6	47.3	17.6	15.9	16.9
1927	43.5	38.9	39.8	16.9	16.0	16.2
Percentage Change over Recorded Rate						
1921	—	− 4.9	—	—	−3.1	+0.3
1922	—	+ 0.4	—	—	−7.4	−3.2
1923	—	+ 0.4	—	—	−5.5	−4.7
1924	—	− 3.7	—	—	−8.5	−5.4
1925	—	− 2.2	−3.3	—	+4.9	+0.9
1926	—	− 1.6	−4.3	—	−9.7	−4.0
1927	—	−10.6	−8.5	—	−5.3	−4.1

among the resident births outside the county for the years 1925 to 1927 before the child had returned to Cattaraugus County, the total resident deaths recorded in the county have been related to the total births to resident mothers 1921 to 1927, the number of births to resident mothers occurring outside the county 1921 to 1924 having been estimated. The total resident mortality from respiratory, digestive and other causes exclusive of those classified as "early in-

TABLE VI

NUMBER OF DEATHS UNDER ONE YEAR OF AGE REGISTERED IN URBAN CATTARAUGUS COUNTY AND NUMBER THAT WERE RESIDENTS OF URBAN AREA, 1921–1927

Year	Number Registered in Olean and Salamanca					
	Total	Non-residents of Urban Area		Net Number of Residents*	Decedents Born outside of County	Deaths among Residents Born in County
		And of County	But Residents of County			
1921	69	7	7	55	2	53
1922	73	3	7	63	1	62
1923	71	5	4	62	0	62
1924	48	6	3	39	1	38
1925	62	5	7	50	0	50
1926	61	8	3	50	1	49
1927	50	11	3	36	1	35

*No deaths of urban residents were registered in rural districts. One death occurred in New York State outside the county in 1925, none in 1926 or 1927.

fancy" is lower than the registered rate in 5 of the 7 years, the difference varying from 0.7 to 1.9 deaths per 1,000, with a maximum decrease of 5 per cent. The total resident rate is slightly higher than the rate for residents born in the county in 6 of the 7 years; so the difference between the recorded and the resident rates obtained by the exclusion of non-residents is somewhat greater than the difference between the recorded and the total resident rates.

Although in these years the difference between the two resident rates is not marked, the rate for the total resident infants is the more truly representative. In obtaining the death rate among infants born in the county, the deaths of certain *resident* infants whose births occurred outside the county must be excluded although conditions leading to these are chargeable to the county. This exclusion has proportionately smaller effect on the rate for broad groups of causes than on the rate for a single cause. Thus, there may have been 5 deaths from diarrhea, one of which was a resident infant born in Buffalo; the exclusion of this death will reduce the mortality rate for this cause nearly 20 per cent since the population base differs only slightly for

TABLE VII

NUMBER OF DEATHS UNDER ONE YEAR OF AGE REGISTERED IN RURAL CATTARAUGUS COUNTY AND NUMBER THAT WERE RESIDENTS OF RURAL AREA, 1921–1927

Year	Number of Deaths of Rural Residents					
	Registered in Rural County*	Registered in Urban County	Registered outside of County	Total Known Deaths	Decedent Born outside of County	Deaths among Infants Born in County
1921	60	7	—	—	1	66
1922	71	7	—	—	3	75
1923	59	4	—	—	2	61
1924	49	3	—	—	2	50
1925	40	7	1	48	0	47
1926	34	3	1	38	1	36
1927	36	3	1	40	2	37

* Excludes one non-resident death in 1922.

the two rates. On the other hand, if several years are grouped when dealing with the mortality from a single cause, so that 1 death will not be so large a part of the total, the rate for residents born in the county would give a close approximation to the total resident rate.

Obviously the true infant death rate for urban and rural parts of the county is to be obtained by allocating the births and deaths re-

TABLE VIII

RECORDED AND RESIDENT INFANT MORTALITY RATES IN URBAN AND RURAL CATTARAUGUS COUNTY, 1921–1927

Year	Deaths under One Year per 1,000 Live Births			Percentage Change over Recorded Rate	
	Recorded	Among Residents Born in County	Among Total Known Births	Rate among Residents Born in County	Rate for Total Known Residents
Urban					
1921	83.0	72.3	—	−12.9	—
1922	94.4	91.9	—	− 2.6	—
1923	97.5	97.5	—	0.0	—
1924	63.0	58.9	—	− 6.5	—
1925	79.4	78.5	78.6	− 1.1	−1.0
1926	74.8	77.4	77.8	+ 3.4	+4.0
1927	61.2	56.0	57.1	− 8.5	−6.7
Rural					
1921	73.1	77.2	—	+ 5.6	—
1922	89.4	87.2	—	− 2.5	—
1923	82.6	80.3	—	− 2.8	—
1924	68.8	65.2	—	− 5.2	—
1925	62.1	65.5	62.9	+ 5.5	+1.3
1926	56.6	52.6	52.0	− 7.1	−8.1
1927	59.3	53.7	55.0	− 9.4	−7.3

TABLE IX

INFANT MORTALITY RECORDED IN URBAN LOCALITIES OF CATTARAUGUS COUNTY BY TWO GROUPS OF CAUSES COMPARED WITH MORTALITY AMONG RESIDENTS BORN IN THE COUNTY AND WITH MORTALITY AMONG TOTAL KNOWN BIRTHS TO RESIDENT MOTHERS, 1921–1927

Year	Deaths under One Year per 1,000 Live Births from Specified Causes					
	Congenital Malformations, Premature Birth Injury and Other Early Infancy Causes			Communicable, Respiratory, Gastrointestinal Diseases and Other Causes		
	As Registered	Residents Born in County	Total Known Residents*	As Registered	Residents Born in County	Total Known Residents†
1921	40.9	30.0	—	42.1	42.3	44.7
1922	54.3	51.9	—	40.1	40.0	41.1
1923	57.7	56.6	—	39.8	40.9	40.3
1924	42.0	38.8	—	21.0	20.2	21.4
1925	57.6	54.9	55.5	21.8	23.6	23.1
1926	53.9	56.9	56.0	20.8	20.5	21.8
1927	41.6	35.2	34.9	19.6	20.8	22.2
	Percentage Increase or Decrease in Rate due to Correction for Residence					
1921	—	−26.7	—	—	+0.5	+ 6.2
1922	—	− 4.4	—	—	−0.2	+ 2.5
1923	—	− 1.9	—	—	+2.8	+ 1.3
1924	—	− 7.6	—	—	−3.8	+ 1.9
1925	—	− 4.7	− 3.6	—	+8.3	+ 6.0
1926	—	+ 5.6	+ 3.9	—	−1.4	+ 4.8
1927	—	−15.4	−16.1	—	+6.1	+13.3

* Deaths outside the county of resident infants unknown 1921–1924.

† Deaths outside the county from causes other than "early infancy" would be rare and are offset by deaths in the county of infants who became residents sometime after birth.

corded in the county to the place of usual residence of the mother, in addition to adding those resident births and deaths recorded in outside districts. The number of deaths of children under 1 year of age registered in urban and rural Cattaraugus 1921 to 1927 is shown in Tables VI and VII, together with the number to be deducted or added, to obtain the net number of deaths among the resident population under 1 year of age.* Two resident totals are shown for each area; one being the number after allocating the deaths of resident infants born in the county and deducting those born outside the county, as well as the non-resident deaths; the other being the total number of known resident deaths after allocating all deaths registered in the county and those known to have occurred outside. The rates obtained when these totals are related to their respective populations are shown in Table VIII.

* The population under 1 year of age, i.e., births to residents of urban and rural Cattaraugus County after allocating to usual residence, is given in Table I.

The infant death rate, both urban and rural, is lowered in most of the 7 years when based on either the net number of deaths among the resident population under 1 year of age born in the county, or the total, including those born outside the county, instead of on the number of deaths and births recorded in the urban or rural districts. The difference between the two resident rates is very slight in nearly every year. The per cent that the corrected rates are above or below the registered rates is indicated in Table VIII. The lower resident rate in the urban section is explained by the relatively high death rate in the first week of life among the births to non-residents of the urban districts, and to the deaths among non-resident infants brought to Olean for hospital care; but the lower resident rate in the rural section results from a marked increase in the population under 1 year of age when all births to rural mothers have been allocated to that section. Since both rates are reduced, the relative infant mortality

TABLE X

INFANT MORTALITY REGISTERED IN RURAL DISTRICTS OF CATTARAUGUS COUNTY BY TWO GROUPS OF CAUSES COMPARED WITH MORTALITY AMONG RESIDENTS BORN IN THE COUNTY AND WITH MORTALITY AMONG TOTAL KNOWN BIRTHS TO RESIDENT MOTHERS, 1921–1927

Year	Deaths under One Year per 1,000 Live Births from Specified Causes					
	Congenital Malformations, Premature Birth Injury and Other Early Infancy Causes			Communicable, Respiratory, Gastrointestinal Diseases and Other Causes		
	As Registered	Residents Born in County	Total Known Residents*	As Registered	Residents Born in County	Total Known Residents†
1921	45.1	50.3	—	28.0	26.9	27.2
1922	53.4	55.8	—	36.0	31.4	33.6
1923	42.0	44.7	—	40.6	35.5	38.2
1924	44.9	44.3	—	23.9	20.9	21.1
1925	38.8	41.8	40.6	23.3	23.7	22.3
1926	43.3	40.9	39.7	13.3	11.7	12.3
1927	46.1	42.1	44.0	13.2	11.6	11.0
Percentage Increase or Decrease in Rate due to Correction for Residence						
1921	—	+11.5	—	—	− 3.9	− 2.9
1922	—	+ 4.5	—	—	−12.8	− 6.7
1923	—	+ 6.4	—	—	−12.6	− 5.9
1924	—	− 1.3	—	—	−12.6	−11.7
1925	—	+ 7.7	+4.6	—	+ 1.7	− 5.9
1926	—	− 5.5	−8.3	—	−12.0	− 7.5
1927	—	− 8.7	−4.6	—	−12.1	−16.7

* Deaths outside the county of resident infants unknown 1921–1924.

† Deaths outside the county from causes other than "early infancy" would be rare and are offset by deaths in the county of infants who became residents sometime after birth.

from all causes in the two areas is not materially changed except in 1921 and 1926.

From year to year, the effect on the infant mortality rate of allocating all births and deaths in the first year of life to their place of usual residence varies widely for both urban and rural rates. No estimate of the probable effect of this factor in one year could be based on the known experience in another year. There is, however, a fairly definite indication that the trend is toward a widening difference between the uncorrected and the corrected rate for both.

In Table IX, the infant death rates in Olean and Salamanca, and in Table X the rates for the rural district have been classified as those "peculiar to early infancy" and all other causes, chiefly respiratory, gastrointestinal and communicable diseases. The rates based on the registered births and deaths in each year from 1921 to 1927 are compared with the two series of rates for resident infants.

The effect of correction for non-residents on the urban mortality from "early infancy" conditions varies widely for these 7 years, ranging from a decrease of 27 per cent in 1921 to an increase of 5.6 per cent in 1926 when residents born in the county are considered. Again the total differs only slightly from the incomplete resident rate. For the rural part of the county, the death rate from "early infancy" causes in the earlier years was increased by the reallocation of the births and deaths of rural residents recorded in urban localities, but in most recent years the rate is reduced. A maximum increase by correction for residence of 11.5 per cent is indicated in 1921 and a maximum decrease of 8.7 per cent in 1927. Since the annual rates as well as the effect of correction show wide annual fluctuations, the following comparison of the corrected and uncorrected rates for the most recent 3 years with the previous 3-year period in each area is of interest:

DEATHS FROM "EARLY INFANCY" CAUSES PER 1,000 LIVE BIRTHS IN CATTARAUGUS COUNTY

Period	Recorded Rate	Rate among Residents		Per cent Change	
		Born in Co.	Total	Res. Born in Co.	Total
Urban					
1922–1924	51.26	49.08	—	−4.2	—
1925–1927	50.95	49.08	48.91	−3.7	−4.0
Rural					
1922–1924	47.07	48.60	—	+3.3	—
1925–1927	42.66	41.59	41.42	−2.5	−2.9

The corrected resident rates for the urban and rural parts of the county bring out more definitely than the officially recorded rate two

interesting indications: (1) the mortality from "early infancy" in the two areas was almost identical in the earlier 3-year period; (2) the rural rate declined 15 per cent in the later 3-year period compared with 10 per cent shown by the recorded rates.

The total resident urban death rates from respiratory, gastro-intestinal and communicable diseases are from 1 to 13 per cent higher than the registered rates, and the difference is more marked in the total resident rate than in that for residents born in the county. The opposite is true of the rural death rates, from these causes: For the rural section the rates are lower after correction for residence, and

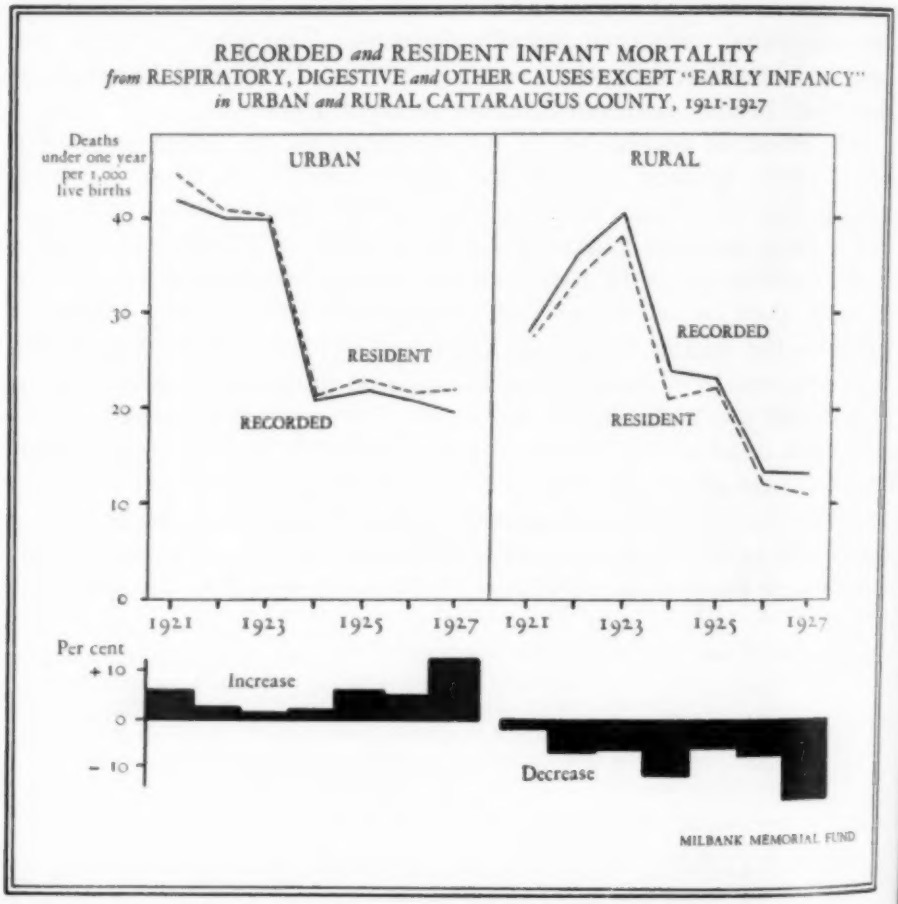

FIGURE III—Infant mortality rates from all causes except "early infancy" in urban and rural Cattaraugus County as officially recorded compared with the resident rates and the percentage change resulting from correction for residence, 1921–1927.

the total resident rate shows less difference in most years than the rate for residents born in the county. Since the urban rate is increased by correction for residence, and the rural rate is lowered, the divergence in the rates for the two areas is widened, as shown in Figure III. The corrected rural mortality from communicable, respiratory and gastrointestinal diseases is lower than the urban in every year, whereas the registered rates were higher in 3 of the 7 years, and in the other the difference between the two is widened.

SUMMARY

It seems essential that the infant mortality rates should be corrected for residence if an accurate picture of the changes in the death rates from year to year or of the comparative mortality from specific causes in different areas is to be obtained. In Cattaraugus County, the officially recorded infant mortality from all causes for 1927 was 15 per cent lower than the 1925 rate, while the resident rate showed a decrease of 20 per cent; the recorded death rate from causes peculiar to early infancy was 11 per cent lower in 1927 than in 1925, but the corrected resident rate was 16 per cent lower in 1927 than in 1925. Thus, the inclusion of non-residents reduces the decline in the death rate indicated for recent years.

If the infant mortality rates in urban and rural sections are compared, the results are very unreliable unless corrected for residence.

The difference between the death rates for resident infants born within the county and the rates after reallocation to the county of resident births and deaths occurring outside the county is not striking in 1925, 1926 and 1927, for which both are available. Since the total resident rate is sometimes higher and sometimes lower than the rate obtained after excluding all non-residents and the group of infants born outside the county, differences between mortality from specific causes or in different areas may be either widened or lessened by using the former rate instead of the latter. The total resident rate, being more accurate, is to be preferred, but the use of the rate for residents born in the county yields fairly good results unless a single year's rate or a single cause of death is selected for close scrutiny. In using rates for residents born within the county, it would be necessary, however, to check these against a total resident rate from time to time because hospitalization is still increasing, and because the opening of a hospital in some nearby city, or provision of hospital facilities within a rural area may bring about a change.

Although Cattaraugus County is a small area, the difficulties encountered in attempting to study its infant mortality records in con-

siderable detail are typical of those to be found in the average county. The fact that there has been a health demonstration in this county since 1923 may have brought about a more rapid increase in hospitalization of maternity cases than has occurred in other rural counties but the trend toward hospitalization is general. Few, if any, counties will be so situated that the rural populations will be served entirely by hospitals within the county limits or that the hospitals will not be used by non-residents. Correction of rural rates for residence is more difficult than of the rates for an urban community well supplied locally with hospital facilities, because in the latter case the exclusion of non-residents will usually be sufficient and the information is available at the local registrar's office. For a rural area, for which it is necessary to trace the resident births which occur in outside hospitals and determine the deaths among them, a corrected resident rate is very difficult to obtain. This is a serious handicap in the analysis of rural infant mortality, and of other rural death rates. The publication of resident data by the central bureaus (state and federal) would be of great assistance to persons interested in following the mortality experience of a specific community.

ACKNOWLEDGMENTS—Acknowledgments are made to the Cattaraugus County Health Department, especially to Frances King, Statistician, for assistance in compiling the data, and to the Bureau of Vital Statistics, the New York State Department of Health, for access to the certificates.

New Booklet on the Care of the Baby

UNDER the title, "Your Baby's Care," Dr. Susan P. Souther of the Children's Bureau of the U. S. Department of Commerce has prepared an interesting 32-page booklet on the hygiene of the child under 2 years of age. This booklet has the approval of the Medical Advisory Committee of the American Child Health Association and a Committee of the State and Provincial Health Authorities of North America. It is attractively printed in readable type with interesting illustrations. To add to its usefulness as a textbook for the mother of the young child, the booklet includes an index and a table of contents. This newest publication on child health is offered free to health officials and social agencies by the Life Conservation Service of the John Hancock Mutual Life Insurance Company, Boston, Mass. Sample copies may be obtained at any time after April 25.

Beverages*

RELIABLE estimates indicate that 12 billion bottles of soft drinks will have been consumed in the United States in the year 1928, an increase of 1 billion bottles over 1927. In addition, stands and stores selling orange and other fruit drinks may be found in almost every city business block. Not only has the beverage industry greatly increased sales, but real progress is being made in using natural fruit beverages, chocolated milk products, etc., in place of artificially colored and flavored and sometimes artificially sweetened drinks.

A review of the literature shows an almost total lack of activity in the health aspects of beverages. While some research work has been done by the fellowship established at one of our state colleges by beverage manufacturers, it has been mostly along commercial lines. It would seem as though public health officials were not interested in beverages or foods, until an epidemic occurred. This apparent inactivity is not confined to research, but is evident in legislation for the control of the industry.

The secretary of a group closely allied to beverage production recently issued instructions for the labeling of artificial raspberry soda. To be legal in all states, eleven different forms of declarations of color and flavor were required. There is almost as great variation in bacterial and chemical standards.

Some states have recently enacted laws that should make for better control of the soft drink industry. Michigan's law requiring the registration of all beverages provides that the registration fee shall go toward the maintenance of a fund for the inspection and control of the beverage industry. Indiana's water law requires that beverages meet a certain standard bacterial count as well as the usual colon standard.

In Chicago, stands are operated in almost every block of the business district, selling orange drinks—some natural fruit, and others entirely artificial. In May, 1926, sanitary control was inaugurated, requiring the taking of weekly samples for bacteriological examination. Orange beverages were required to comply with the standard for drinking water on interstate carriers. During 1926, 542 samples were examined, of which 166, or 30 per cent, showed the presence of colon bacilli. In 1927, 1,375 samples were examined, and 10 per cent

* Report of the Committee presented to the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

were colon positive. In May, 1928, a survey revealed that some orange drinks contained as much as 20 per cent fruit juice, others as little as 2½ per cent, while still others were wholly artificial; yet with the aid of flavoring extracts and colors, all looked the same to the consumer.

In view of present knowledge as to the value of the vitamin and mineral elements in fruit juices, Chicago officials hold that control of the amount of fruit juice in an orange beverage is just as important, from a public health standpoint, as the control of butterfat in milk. Regulations promulgated June 23, 1928, require:

1. Fresh fruit orange drinks must contain 10 per cent orange juice. Artificial drinks must be sold as such and patrons advised of the contents.
2. Employes submit specimens of feces and urine for typhoid examination.
3. If orange peel is used in the manufacture of beverages, the oranges must be subjected to a chlorine bath sufficient to disinfect the exterior.

While orange drinks have been the common beverage in Chicago, fruit juices such as pineapple, lemon, and grape are popularly used in other cities, and an investigation will probably reveal conditions similar to those found in Chicago previous to the adoption of these regulations.

COMMITTEE RECOMMENDATIONS

It is recommended that the membership of the Committee on Beverages be increased to 6 and that this committee be divided into 3 sub-committees, each having a definite, prescribed program along the following lines:

1. A study of methods of manufacture of beverages, and machinery used, with the object of developing types of machinery that may be easily cleaned and safe to use.[1] Levine states that with some types of filters water has a higher bacterial count after filtration than before.
2. A study of methods of inspection and legislation, with the object of developing a uniform method of inspection and control; the sub-committee on this subject to have as its goal the production of a standard beverage law or ordinance similar to Frank's standard milk ordinance.
3. A study of foreign substances now used in beverages such as saccharin, saponin and preservatives, with the object of determining their usefulness in beverages and their harmful effects on man.

T. J. KING
MAURICE J. DOOLING

REFERENCE

1. *Am. Food J.*, 22: 19–20, 1927.

Steps in Planning a Health Education and Publicity Program*

Why Have a Plan?

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SUPPOSE that you had time to plan health education and publicity a year ahead. Suppose you were to go about it as though it were an engineering problem, not an odd job for spare moments. How would you analyze the steps in your year's program? Would you, perhaps, begin by setting down your objectives? It is not likely that you keep a card file of possible objectives from which two or three could be selected at random. How then, does one decide what are to be the goals for a given year, say, 1929? How are the best methods of reaching them determined?

These questions are not intended to bring forth broad and impressive statements of purpose, but real, practical, working plans. Each of the papers here presented discusses one essential factor in this kind of planning. No exact formulas are offered; we start with two propositions which we believe to be sound:

1. Advance preparation of a carefully thought out program is essential to good work in health education and publicity.

2. The basis for program making is a study of one's situation so as to determine not only what sort of a response should be sought from the public, but also what is the best procedure in trying to get that response.

Both the selection of goals and the steps to be taken in arriving at a program for reaching them are discussed in the group of articles which follow.

In order to obtain examples of publicity programs for discussion, a request was sent to health departments and health organizations to submit outlines of their plans for the year ahead or for a given project. It was suggested that the outline should answer these questions:

1. Why will you undertake what you are planning? What facts or circumstances or desires lead to the choice of activities?

2. What results are sought? What are the objectives of the responses hoped for?

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* Papers from a symposium of the Public Health Education Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17 and 18, 1928. Papers by C.-E. A. Winslow, Dr.P.H., and Franklin Fearing, Ph.D., will be published in the June JOURNAL.

3. To whom will you address the messages? What groups or kinds of people will you try to reach as being most important in getting the results wanted?

4. What is to be the message—the chief talking points—in each special activity?

5. How will you approach the selected groups or kinds of people? What do you believe to be their attitude toward the subject, and their understanding or lack of understanding of the subject? What motives, such as fear, the desire for good looks, civic pride, etc., will be appealed to in seeking action?

6. What are to be the methods and materials used in handling the several situations? List what you will do and what forms of publicity you will use.

In addition to the above please list the routine activities, such as day-by-day news which does not relate definitely to the program of effort for the year, the bulletin or house organ, giving out printed matter or information on request, etc.

7. Supplementing the above it will be useful to make up a calendar showing what is to be done month by month in both the preparation and carrying out of the publicity activities.

About 30 programs were received in response to the request. A few of these gave definite and clear-cut answers to the whole list of questions. Some of them gave lists of methods to be employed together with brief mention of the topics to be emphasized. One publicity calendar told what schedule would be followed month by month as suggested in question 7.

The starting point in mapping out a program is naturally its objectives. For our present purposes, we may assume that objective means the response desired from the persons addressed. In most instances the expected response takes the form of readiness to act in certain ways immediately or when the occasion arises. An analysis of the circumstances likely to influence the action of those to whom publicity is addressed is an important factor in the choice of objectives.

For example, a program of education in personal hygiene directed toward persuading city dwellers with small incomes to follow a proper diet, sleep with the windows open, dress to suit the weather, stay out of crowds, exercise daily, take enough rest, and avoid worry, brings the planner face to face with a number of social situations closely bound up with the ability of the average citizen to act on such advice. One must consider the price of eggs, the architecture of homes and offices, fashions in clothing, the transportation problem in cities, modern family life with its restraints, responsibilities and frictions for the individual member, the tremendous urge to acquire debts through instalment buying, and the continuous uncertainty of employment.

In planning health education, shall we leave these questions alone or try to adjust our advice to the persons who are thus handicapped? Shall we even take a hand in changing the conditions? In the present discussion fortunately we do not need to decide which course to fol-

low. We need only to observe that an effort to plan health education so it will be acted upon, instead of merely giving it out in a " take it or leave it " manner, sometimes brings us face to face with problems which it is more comfortable to ignore.

In contrast to the complexities of an educational program directed toward daily habits of living, the diphtheria campaign illustrates a fairly simple situation, in which to decide what we wish people to do, who are the persons to reach, what method of approach will influence them to action, and so on. The audience is easily identified; the thing to be done can be described simply and clearly; and it is reasonable to look forward to completing the whole task in a few years. Here analysis yields results in sound and workable programs.

The next step is to select and identify the persons to whom publicity is directed. This question is closely bound up with objectives. For example, the objective may be to persuade *parents* to see that the child's birth is registered, or *citizens* to vote " yes " on a bond issue.

Another factor in the health education program is the selection of the subject matter. Some of us solve this problem of selecting the message by telling all we know; others of us tell what is uppermost in our minds.

Some understanding of the mental attitudes of persons to be approached in matters of health conduct is important to every phase of a health education program, from the picture on the cover page of a folder to the signature of a letter. Principles of attention, interest and motivation must form the basis of the plan of approach to a particular public.

The forms of expression and the channels through which information from health organizations goes to the public should be adapted to the audiences and the subject matter. In considering the publicity methods to be used in a given situation, we are too often prone to follow the path of least resistance, to select methods which are immediately feasible due to the special ability of some member of the staff or to some special opening made possible by a contact with an interested newspaper or a friendly service club.

Ten years ago the writer listed 60 forms of publicity available for working up attendance at an exhibition. That was before the days of radio, talking pictures, air mail delivery, animated cartoons and other recent inventions for rapid, wide and graphic expression of facts and ideas. With such a wide range of methods to choose from, the planner who states that he expects " to use every available avenue for reaching the public " places himself under the suspicion of having no plan at all, or, at least, no appreciation of the wide range of choice open

to him, and of the importance of selecting wisely the methods to use under any given circumstances. Discussion of this essential part of planning, namely the selection of appropriate forms of publicity, is omitted from this symposium, since it is rather fully treated in easily available books and articles.

The preparation of a calendar or schedule has also been omitted from the discussion. In planning the year's work such a schedule naturally divides itself into: (1) routine publicity, such as publication of a bulletin, release of current news to the newspapers, responding to requests for printed matter, and the like; (2) special projects relating to the season of the year or having some other element of timeliness; and (3) emergency or "opportunist" publicity which seizes upon an unexpected situation, like an epidemic, as an occasion for a special educational campaign.

Emergency events cannot, of course, be scheduled; but the program as a whole may be made flexible enough to allow for substitution of publicity on unexpected events or situations when the occasion arises.

In practice, health education is often considered not as a distinct project but as an incidental part of the work of conducting clinics, nursing service, or administrative work. It is carried out by health officers or executive secretaries who combine it with other duties. The procedure here outlined recognizes the close relationship between publicity and service or administrative work, but considers it as a separate unit of work with a technic and objectives of its own. This fact needs to be kept in mind throughout the series of papers which follow in order to avoid confusion.

Objectives of Publicity—On What Basis Are They Selected?

HOWARD WHIPPLE GREEN, FELLOW A. P. H. A.

Secretary, Cleveland Health Council, Cleveland, O.

SUCCESSFUL health programs have definite objectives. The reason for the program may be a high death rate, a high infant mortality rate, a high diphtheria case or death rate, a high tuberculosis death rate, increasing cancer or heart disease mortality, or extensive sickness. When the facts are once established a further statistical analysis must be made in order to obtain a definite idea of the particular cause of the difficulty. The reason for its existence must be sought.

Let us, for example, consider means for the further reduction of infant mortality. The infant mortality rate has decreased considerably during the past two decades. The death rate of infants in Cleveland in 1910 was 147 per 1,000 births; 2,033 deaths occurred. The rate in 1927 was 59; 1,133 deaths occurred. The much larger number of births occurring in 1927 than in 1910 is reflected in these rates.

The first question would probably be "What causes these deaths?" We find that 790, or 39 per cent, in 1910 were caused by diarrhea and enteritis, and 252, or 12 per cent, by premature birth. In 1927, 99, or 10 per cent, were caused by diarrhea and enteritis and 353, or 34 per cent, by premature birth. The deaths due to diarrhea and enteritis have decreased greatly, and fairly regularly each year. A considerably further decrease is not possible. Even though no deaths due to diarrhea and enteritis occurred, the infant mortality rate could only decrease from 56 to 51.

What is the significance of this fact? Simply this—if, as in Cleveland, the deaths due to diarrhea and enteritis under 1 year have approached an irreducible minimum, attention must be directed to other important causes of infant deaths. The next most important cause is premature birth. It is also evident that the percentage due to prematurity has increased, although the rate is about the same in 1927 as in 1910, namely, 18 per 1,000 infants born alive. However, the largest number of infants in 1927 died because they were prematurely born. An extension of the program already demonstrated to be so effective in reducing the deaths due to diarrhea and enteritis is not indicated because this program has had no effect in reducing the deaths due to premature birth.

No demonstrable effect—why? The greater number of deaths due to diarrhea and enteritis occurs in the last 7 months of the first year of life. The greatest number of deaths due to premature birth occurs during the first 7 days of life, 60 per cent in the first day, and 88 per cent in the first week. It is evident, therefore, that what is done to prevent deaths from this cause after the infant arrives is of little avail because the infant is with us for so short a time. Therefore attention must be directed to the period before birth, and to the institution of prenatal work.

We have found our audience and have defined our fundamental problem. Our basic objective is to reduce deaths due to premature birth. Our audience is the expectant mother. We must now search for the cause of deaths due to premature birth and arrange our publicity to interest our audience and eliminate the causes.

We can emphasize the nutrition necessary for the mother in order

to build sound teeth and good bones for the expected baby. We must interest the pregnant woman in giving birth to a baby free from syphilis. We may even attempt to interest her in mental hygiene. But as yet we have not the stimulus to get our audience and allow us to dispense our instruction, until we remember the layette. What preparation is necessary for the new baby? What clothes are needed? How shall these be made? Now that we have the stimulus, we can push forward the publicity with an assurance of results, because human interest has been aroused.

The tuberculosis death rate is decreasing slowly but surely. For white males between 15 and 25 years of age in Cleveland it decreased 52 per cent in 12 years, but for white females between 15 and 25 years of age only 14 per cent. There we have the fact basis established. The problem is before us—what is the solution?

We make our suppositions, we use our scientific imagination, and to what avail? We have a definite objective for our publicity program—our audience defined!

We decide that girls must be interested more in their health than in their boyish form and their social whirl. But health by itself is of no interest to the modern young lady. Interest her in health as it relates to vitality, good looks, attractiveness, personality, success, and it becomes of first importance.

Contacts with girls of the age we wish to reach may be made most readily through the school teacher, club leader, Sunday School teacher, employment manager, or leaders of girl scout, camp fire, and girl reserve groups. Convincing the leaders of these groups of the importance of health is the first and most important step. Furnishing them with material with which to interest the girls is no less important, but much easier. Finally, placing interesting material directly in the hands of the girls at frequent intervals clinches the program.

DISTRICT PROBLEMS

Statistical analysis indicates the relative importance of our various programs.

We may wish to defeat a chiropractic licensing bill. Our analysis shows many of our voters to be antagonistic to physicians. They consider physicians perhaps as members of a medical trust. Why then should they, as poor voters, strengthen this trust? The objective is definite. The emphasis must be shifted to that of showing the physician as protecting the public health rather than allowing argument to arise between physician and charlatan. The campaign must have as its objective the defense of the public health and interest not only

doctors but dentists, druggists, employment managers, and allied groups.

Antagonism breeds antagonism, but a promotion program for the public good can unite under its banners every individual and organization with this as an objective.

Publicity connected with social work, especially in other fields than public health, has been chiefly concerned with the raising of money rather than the correction of existing faulty basic conditions. The chief reason for publicity methods having been confined to this one field has been a lack of definite statistical data relative to the community, and particularly to various sections of the community. Studies of the composition of the population of large cities and of the particular ills from which it is suffering have been made at various times and in various places. However, the minute analyses of various sections are imperative as a basis for any attempt to alter faulty conditions. Such analyses are being undertaken in Cleveland, using the fundamental data collected by the United States Government each 10 years relative to the populations of small areas of constant geographical boundaries, known as census tracts, or sanitary districts. Social data of all kinds are being collected relative to each census tract. These include the births, causes of death, causes of sickness, the chronically ill, crippled children, dispensary cases, cases cared for by family case work organizations, mothers' pensions, juvenile courts, visits made by the visiting nurse, illegitimate births, houses of prostitution, and so on.

In regard to census tracts, the following points are significant: One may have only 10 persons per acre, another 141 per acre; one may have a population with 40 per cent of the adults illiterate, i.e., unable to write any language; in another 50 per cent of the population may be under 15 years of age, in still another, only 4 per cent. The people living in certain census tracts seem to come to more grief than those in others. A tract in which the family welfare case rate, the tuberculosis death rate, the infant mortality rate, and the rate of juvenile court cases are high, in which houses of prostitution are numerous, in which rents are low and housing conditions bad, merits the attention of any publicity person.

The causes of the conditions must first be sought, the objectives of the publicity determined, the audience called to attention. Then and only then may reform be basic and improvements permanent.

The objectives of the publicity must be based on facts determined with scientific accuracy, and when determined, the audience to be reached is defined, and the methods to be employed may be fixed with some degree of exactness.

Audiences--How to Select and Classify Them

MARJORIE DELAVAN, FELLOW A. P. H. A.
Michigan Department of Health, Lansing, Mich.

JUST as the objectives of a health education and publicity program are determined by a thoughtful and unprejudiced analysis of existing conditions, so are the audiences to be approached defined by the objectives. The term "audiences" in this sense is not limited to those who listen to lectures, but includes everyone who can be reached by any of the publicity avenues at our command.

Audiences are always, in one way or another, selected. They are naturally and automatically selected by the objective chosen. They may then be further and more arbitrarily limited on the basis of available finances, personnel, or time. Our newspaper stories, posters and exhibits carry on their own selective process by the material that they present. Since selection is inevitable, we can agree that it may well be made a conscious and reasoned proceeding in view of its importance to the success of the campaign.

The first step in choosing our audiences is to decide what individuals and groups are directly and indirectly concerned in the attainment of our objective. We have become so thoroughly organized that we think in terms of groups. The organized group is tangible, it has a president who can be convinced, a well defined and counted membership, and a regular meeting day. In some types of campaigns, such as teaching personal hygiene to school children, dependence on the organized group is a safe solution. When time and funds are limited it is often the only one, but with adult groups, where belonging is a matter of choice, it is usually incomplete because the very person we wish most to reach may not be enrolled. Valuable and temptingly convenient as it is, it can never take the place of the individual approach whenever the latter is feasible.

Covering the organized groups of a community, a feat which we are prone to view with satisfaction, is not equivalent to reaching the whole audience. In any publicity campaign it is well to burn a little midnight oil in considering the person who does not belong to clubs.

Going back to the mechanics of the selective process, the audience of primary importance is made up of the individuals upon whose direct action rests the attainment of the objective. In Mr. Green's illustration this person was the prospective mother. In a diphtheria protection program it is the father and mother of the diphtheria-age child. In periodic health examination campaigns it is the adult who comes

within the age group threatened by the degenerative diseases. In a vaccination campaign it is the unvaccinated—or un-revaccinated—person. In a bond issue for a safe municipal water supply the voter who drinks the water is the individual most intimately and directly concerned, the one whose action we wish to stimulate.

Having chosen the individuals who make up this primary audience in any campaign, the next step is to map out their convenient group affiliations. In what organized groups can we find them? Does the prospective mother belong to clubs? Are the fathers and mothers of diphtheria-age children members of any groups? If we can honestly answer " yes," then the solution is enormously simplified. Unfortunately, we often have to answer " no," especially when it comes to prospective mothers and mothers of preschool children. Here the individual approach may be the only inclusive method.

By the individual approach I mean direct contact with the individuals making up the primary audience, with no reliance upon intermediate agencies. For instance, in the campaigns for the promotion of breast feeding that are being carried on by the Bureau of Child Hygiene and Public Health Nursing of the Michigan Department of Health, the path to the mother is direct. The nurse gets from the county clerk the names of parents of babies under 6 months, or under 1 year if a more thorough canvass can be made. She then visits those mothers. In this case the message is delivered directly to the primary audience, and to every member of it.

A variation of this method can be illustrated by the preparation for preschool clinics. A plan of carefully districted home calls can be delegated to a group, such as a mothers' club or a parent-teacher association. This is simply utilizing a group in the individual approach.

Having selected our primary audience and mapped out its group affiliations, the next step is to determine the agencies, individuals or groups that are not personally concerned in the objective but are necessary to the setting of the stage—for after all, most of our health campaigns need stage setting. There is no object in creating a desire for action unless there is a reasonably easy outlet. And to limit our selection of audiences to those that are provided with that outlet is hopelessly to limit our campaign.

There is no point in urging parents to take their children to a physician for toxin-antitoxin in a school where half of the parents cannot afford the treatments, or in a community where there is only one elderly physician and he does not take any stock in new-fangled notions. No particular gain is made when we urge regular medical care during pregnancy, and our prospective mothers live in the plains coun-

try far from a doctor. When we select our audiences we should take care that we either choose those that have the facilities for action at their command, or that we provide such facilities.

The groups and individuals to whom we appeal in this matter of providing the necessary background for action we can term our subsidiary audience. In our diphtheria prevention campaigns we enlist the physicians so that the technical side may be cared for. If the campaign is to be a community venture, with the treatments free to all children, we appeal to the groups who direct or at least influence the expenditure of public funds. We ask the support of the school authorities so that our clinics may be held in the schoolhouse and announced through school channels. We reach the groups who furnish the leadership in public sentiment.

These assisting audiences may or may not include the members of our primary audience. They are chosen on the basis of community leadership rather than immediate contact with the objective. In terming them subsidiary audiences and mentioning them last, I do not in the least minimize their value. They are often the first audience to be approached, and the deciding factor in making possible the whole campaign.

When we have selected our primary audience, found out its affiliations, and chosen our assisting agencies, we have a reasonably clear picture of our composite audience. We are struck at once by the overlapping. I have talked of groups as though they were neat pigeonholes for people, and as though people stayed in their pigeonholes, which is, of course, not true. With our present maze of organizations there is bound to be overlapping, and it is wasteful only when it is duplication. If our material is carefully sifted and prepared, it will reinforce itself by being presented from different angles. Overlapping is not necessarily a drawback in the choosing of audiences.

SUMMARY

The audiences in any publicity campaign are defined automatically by the objectives of the campaign, and limited arbitrarily by the director.

The primary audience is made up of the individuals directly involved, considered as individuals or as groups.

The subsidiary audience consists of the assisting individuals and groups, chosen on the basis of civic leadership.

A thoughtful selection of our audiences, and limitation, in the interest of thoroughness and permanence, aid tremendously in the success of the campaign.

Volatile Solvents Used in Industry*

THE danger to workers in the application of coatings to surfaces of all kinds must be considered under two heads: the character of the coating, and the method of application.

The term " lacquer " is technically applied to a coating which has nitrocellulose as its most important constituent. The solvent is an ester, amyl, butyl or ethyl acetate; and the thinner an aromatic, benzol, toluol or xylol. Castor oil or some other oil may be added as a plasticizer. Normal butyl acetate, with some normal butyl alcohol, is the solvent chiefly used, amyl acetate being more expensive, ethyl acetate less efficient. It is not really necessary to add benzol or any aromatic, but it is cheaper since butyl acetate costs about $1.25 as compared with $.30 for toluol and $.20 for benzol. These last act as solvents as well as thinners up to a certain point, beyond which they begin to precipitate the nitrocellulose. The term " varnish " is technically restricted to a coating made by dissolving a natural gum or resin in a mixture of oil and hydrocarbon.

Next to lead, the most important toxic substance used in coatings is benzol, and here a great improvement has occurred during recent years, due largely to the work of the Benzol Committee of the National Safety Council which, in its final report, laid stress on the danger of even small quantities of benzol in the air of workshops, and urged manufacturers and master painters to substitute toluol, xylol, or the petroleum distillates. This recommendation has been followed by many industrialists, and the use of benzol in coatings is more and more restricted each year. It is still to be found in some lacquers used for spraying because of its volatility. Brush lacquer calls for solvents less volatile than spray lacquer because brush work does not require such quick drying. Indeed, if it dries too quickly, edges and streaks appear. According to one expert, toluol and butyl acetate make a better solvent for spray lacquer than benzol, because the latter evaporates too fast and causes " blushing."

It is certain that in the painting of electrical or agricultural machinery, and in many automobile factories, benzol is no longer used. Varnish and paint removers still contain benzol, but in these as in penetrating stains efforts are being made to find a substitute. In

* Report of the Committee on Volatile Solvents, presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

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protective coatings, little benzol is used except in fabrikoid and patent leather. In roofing compounds and tar paints, tar oil is now used.

Fabrikoid, artificial leather, or textile leather, is made by spreading over fabric a nitrocellulose coating containing benzol, sometimes in large quantity (as high as 60 per cent, according to L. Greenburg). Patent leather manufacture is similar except that the coating is spread on skins and hides. In these two industries, benzol still holds its place as solvent and thinner because it evaporates more quickly than toluol. The coating may be spread by a machine similar to that used in the manufacture of spread rubber goods, or applied with a stiff brush, or pressed into the surface with a broad knife. In this hand work, the men must bend over the skin or fabric, and it is hard to see how exhausts could be so placed as to protect them, for it is difficult to provide even window ventilation without setting up drafts which might deposit dust on the coating and spoil it. This is especially true of patent leather, where the slightest blemish shows.

Hunter and Hanflig, 1927, published reports of 6 cases of severe chronic benzol poisoning, 2 of which were contracted in making patent leather.

In making sanitary cans benzol-rubber sealing compound is being replaced by rubber latex. Other occupations in which latex is displacing benzol-rubber are: making cord fabric for tires; cementing shoes, both rubber and leather; and making dipped rubber and spread rubber goods.

Toluol is displacing benzol in nitrocellulose coatings and lacquers, while naphtha, or the less volatile petroleum distillate "Stoddard's Solvent," has largely displaced it in dry cleaning. Several state organizations of the painters' union have carried on successful agitation against the use of benzol in quick-drying paints and other coatings.

Benzol is still generally used for coating patent leather, and sometimes artificial leather; sealing bottles; fastening rubber heels on leather soles; tire building; and as a constituent of paint and varnish removers; but it is believed by insurance men and by many industrialists that in these processes also substitutes will eventually be found.

Wood alcohol is not used as a solvent except as a constituent of denatured alcohol. The formulas for denatured alcohol permitted by the U. S. Treasury Department were revised in February, 1928. The one most largely used for coatings of all kinds is Specially Denatured Formula No. 1, 5 gallons of wood alcohol to every 100 of ethyl alcohol. Other permitted formulas used for varnishes, japans, lacquer thinners and lacquer solvents, are No. 2A, which has 2 gallons of wood alcohol and 2 of benzol to 100 of ethyl alcohol; and No. 23A,

with 10 gallons of acetone and 2 of benzol to 100 of ethyl alcohol. Denatured alcohol, therefore, as used in the coating industry, contains only a small proportion of wood alcohol.

In the study made by the German Association for Industrial Hygiene, several less familiar solvents are mentioned as being used in nitrocellulose coatings. The less volatile but more toxic cyclohexanol acetate may take the place of butyl acetate, and the place of a ketone, usually acetone, may be taken by carbon tetrachloride, chloroform, tetrachlorethane, or trichlorethylene. These solvents are of little or no importance in the United States. Trichlorethylene is not used in coatings such as paint and varnish; tetrachlorethane is not important because cellulose acetate, for which it is the best solvent, is too expensive, and our lacquers are made with nitrocellulose. Chloroform is not used in coatings in this country, and carbon tetrachloride very little. The solvents chiefly used in the United States are normal butyl alcohol and the acetates, amyl, ethyl, and normal butyl. Among new American solvents are ethyl oxybutyrate and the methyl ester of ethylene glycol known by the trade name " cellosolve " and referred to in the 1928 *Chemical Engineering Catalog* as ethylene glycol monoethyl ether. Both of these are advertised as non-toxic, but master painters report that men using them complain of dry throat, feeling of tightness in the chest, and " dopiness."

The Pennsylvania survey, under the direction of Henry Field Smyth, M.D., made some preliminary toxicity tests on guinea pigs by exposing them in Yant and Frey gassing jars to the vapors of two of the above solvents, and the authors have since made similar tests with all of the others, except benzol, that were reported as present in 5 or more lacquers in the Pennsylvania questionnaire, as well as on one type of turpentine, a solvent sometimes found in the newer, less rapidly drying brushing lacquers. They also included distillates obtained from a spraying and a brushing lacquer, both containing less than 0.5 per cent of benzol.

Keyes divides the usual fluid components of lacquers into four groups, based primarily on their boiling ranges:

1. Low boilers, boiling below 100° C., with benzol as the type. In this group are found, among others, ethyl acetate and ethyl alcohol. They usually comprise 10 to 25 per cent of the liquid portion of spraying lacquers.

2. Medium boilers, boiling near 125° C., including toluol, amyl acetate, butyl alcohol and turpentine. They usually comprise 20 to 45 per cent of spraying lacquer liquid.

3. High boilers, boiling from 150° to 200° C., including xylol. High flash naphtha or heavy gasoline would come in this group. They usually comprise 4 to 10 per cent of spraying lacquers, but would form a larger percentage of brushing lacquers.

4. Plasticizers, boiling above 200° C., and not included in the above list, as they are non-volatile at ordinary temperatures and are used in small amounts only. Therefore, they are not a potential menace to the sprayer as ordinarily used.

In applying the coatings, the use of the spray gun has increased and seems destined to keep on increasing. It is said to be wasteful of paint but more than makes up for this by the saving of labor and the speed. The painter still clings to brush work for varnish and to a certain extent for paint, but lacquers are universally applied by spraying, and are displacing both paint and varnish. A large proportion of paint is also applied by spraying. For automobiles, electrical machinery, railway cars and agricultural machinery, spraying has supplanted dipping and brush work. This means a greater hazard to the painter, but this has been compensated for in part. The paint now used is more often than not lead free; the dangerous work of dry rubbing down lead paint has almost disappeared in all but high grade interior work; the devices for protecting the operator are improving as the construction and forced ventilation of spraying booths and the pressure in the spray gun and its construction improve. The pressure is now sometimes as low as 20 pounds, whereas 60, 80, and even 100 pounds were general formerly.

Pouring the paint or flowing it from a hose is in use in some large shops manufacturing electrical equipment. It is, on the whole, the method least attended with risk to the operator, since he stands at a distance and does not come in contact with the paint at all, nor does he need to be protected against pollution of the air from atomized paint.

ALICE HAMILTON, *Chairman*
ELIZABETH B. BRICKER
HENRY FIELD SMYTH

DISCUSSION

P. W. Gumaer, Barrett Company, New York, N. Y.—In reference to the use of benzol it must be pointed out that substitutes such as toluol often cannot be used, since it is a by-product of coal tar distillation produced in small amounts only. The producers are fully alive to the health hazards, and are going far to educate in the safe usage of such substances. Do we know what benzol poisoning is? I am not a physician, but does a low white cell count always mean benzol poisoning? If I am not mistaken there are a number of other conditions unassociated with benzol which may show a low white count. As with lead poisoning we must have standard diagnostic methods before we can control this hazard and the public concern about it. It is my special province in the company with which I am connected to develop safe procedures for the use of this indispensable product, benzol.

Tentative Record Forms for School Health Work*

School Health Record Form 2

THE form here presented is designed for schools which have medical personnel available for the examination work. This differs from Form 1,† which is for schools having no medical assistance.

Form 2 is designed to bring together in a simple and compact manner those facts about the health of the child which the school can use most advantageously in the child's interest.

Four main groups of facts are called for; namely, (1) communicable diseases and certain other important ailments experienced, (2) immunization record, (3) record of physical examination, and (4) record of absences by cause.

The facts on communicable diseases are of value in guiding administrative action when such diseases are prevalent and it is important to know which children are susceptible and which are immune. The facts on immunization supplement the above record. The physical examination record is needed to assist the school in understanding the child and in guiding his educational program intelligently. The absence record likewise is necessary to a proper understanding of the child. These facts are not ordinarily called for and they constitute a new feature on the school health record. They are inserted here because they are believed to be a potential source of valuable information which has hitherto been greatly neglected.

One difficulty in preparing such a chart is that it presumes certain uniformity in procedure. With varying laws, regulations, organization and personnel, it is quite impossible to devise a single procedure that is best for all places. The committee recommends this card as it stands, conscious that certain adaptations may be necessary to meet differing local situations.

The card shown here is a standard 5″ x 8″ card, Index Bristol, with the entire record on one side. The reverse side can be used for the

* Report of the Sub-Committee on Record Forms (prepared by George T. Palmer, and recommended for experimental use), presented to the Committee on Administrative Practice of the American Public Health Association at its meeting, May 22, 1928.

† Form 1 was published as the pamphlet *Record Forms for Public Health Work*, September, 1927, American Public Health Association, 370 Seventh Avenue, New York, N. Y.

continuous educational record, the local form for which may be printed thereon, or the reverse side may be used for important supplementary notations. It is not intended that the reverse side shall carry the detailed records of home visits by the nurse. This card is to be kept with the teacher, notations on it being made by teacher, nurse and by or for the physician.

Space is provided for the recording of the routine examination findings in terms of a code shown on the card, at three periods during the school life of the child. Preferably these three periods would be the first grade, fifth grade and just before the age when a child is permitted to leave school and secure working papers.

While, from administrative considerations, more than three examinations during elementary school life are not recommended as a routine for all children, it is of course understood that special examinations at more frequent intervals may be quite necessary for certain children.

In mapping out the medical inspection program, time for these special examinations should be taken into account. The routine inspections should not be permitted to take up all available time. Quality of school medical work as well as its utility in the administration of the educational program must not be made to suffer merely for the sake of greater volume.

The value of the medical inspection is at least three-fold: to make available to the educational authorities facts to assist them in planning a course of instruction best adapted to the capabilities of the child; to serve as a demonstration to the parents of the value and utility of professional medical opinion; and, as an outcome of this, to assist the child early in life in eliminating physical defects which may seriously impede his learning and living efficiency. For these reasons it is recommended that every effort be made to secure the attendance of one or both parents at the examination, particularly that made while the child is in the first grade.

One other point should be emphasized. The physician by his training and experience possesses a superior knowledge of anatomy and physiology, and symptomatology of health and departures from health. Consequently his judgment should be utilized to maximum advantage. His time should be conserved and he should be freed from any routine procedures which can be handled with equal satisfaction by one less experienced. Whenever possible the nurse should assist and lighten the physician's burden. The routine inspection of vision and hearing in so far as it is meant to reveal outstanding deficiencies is a matter that is capable of being reduced to a mechanical procedure, the results of which are just as informing under practical

school conditions when carried out under the physician's supervision by nurse or teacher as if done by the physician himself. Doubtful or special cases may very properly be referred to the physician. It is also an economical step to spare the physician the labor of recording his findings on the card. This might better be done by a clerk or, if this is not feasible, by the nurse.

Success in correctly marking the various items called for in the inspection and in securing the alleviation of defects depends so largely on the proper synchronizing of interests of physician, nurse, teacher and parent, that the association of these individuals should be a definite goal on the part of the school administration.

The card is to go with the child as he passes from grade to grade. To be of maximum service all possible information should be recorded when the child enters school, and the other information added from time to time.

GEORGE C. RUHLAND, *Chairman*
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IRA V. HISCOCK
GEORGE T. PALMER
WALTER M. BRUNET
JESSAMINE WHITNEY
MARY BROWNELL
MERRILL CHAMPION

INSTRUCTIONS FOR MARKING RECORD FORM

(Record in ink)

Name—The name can be written with the given name first or last, it is immaterial.
Sex—Use M for males, F for females.
Color—Use W for white, B for black.
Birth Date—This is recorded most simply by figures. Thus, Oct. 17, 1915, would be 10/17/15.
Parent or Guardian—Write name.
Addresses—Several lines are left for addresses as well as date when new address was recorded.

36 Cypress St.—9/16/25
1320 Oxford Place—1/6/27

Diseases—Year—Record the year when the child has the disease indicated or when the ailment was first noted. This entry should be made out as completely as possible when the child enters school, the facts being ascertained by sending a note home to the parents, or it may be more convenient to question the parent when she or he is present for the first examination. There may be some slight error if it happened that there was no physician in attendance at the time of the child's illness. However, these diseases are quite distinct and are usually events well remembered in most households. If this record is made with care, it will prove most serviceable to the teacher later. When measles breaks out she will know by the record what children will probably not have it because of previously having had it, and she will know those who are apt to contract the disease following exposure to active cases. If a child contracts any of these diseases at a later period during school life, the age should be entered by the teacher at that time.

If Tb in Family, who (relation)—This information should be secured from the parents direct or by note. Record "sister," "brother," "father," etc. Knowledge of the fact that there has been or is tuberculosis in the home should make the teacher doubly watchful of the school pupil from that family.

Immunization—The really important facts are to know whether the child has received the complete series of three inoculations and whether a subsequent Schick test indicates that the child is immune to diphtheria. The date of third treatment can be recorded as 10/16/30, meaning October 16, 1930. It is assumed that the details of the first and second inoculations will be kept on a sheet by themselves and that only the final record will be made on this permanent record card. Record age to nearest year. Give the date when the Schick test indicates that the child is immune from diphtheria. Record in figures as 10/19/32.

If a child entering school at 6 years of age was vaccinated successfully when 3 years of age, record the approximate date as 10/—/24. This example assumes that the exact date is not known but the month and year are. Record age to nearest year when the last successful vaccination was given.

If a child is vaccinated again when 9 years of age, record the date as 4/16/32 and underline the word which indicates the result, namely, whether the vaccination was positive ("a take") or negative (no reaction), or showed an immunity reaction, a reddened area for several days which clears up without the formation of the blister or pustule.

The knowledge that pupils are not susceptible to certain diseases either because of immunization or from having had the disease itself will prove of value to the school authorities.

Physical Examinations—Space is purposely limited here in order to encourage the more thorough but less frequent examination. The longer interval between examinations is recommended in order to discourage the superficial character into which annual examinations so commonly have fallen, and to save the time and labor entailed in the acquiring of great masses of records of which but little use can be made because of the inadequacy of the staff for the purpose in the average school.

Grade—Record school grades as I or V. (Roman numerals.)

Date—Record in figures as 10/13/27.

Parent Present (yes or no)—Write yes if parent or guardian was present at the examination; no, if not present.

Nutrition—Grade in terms of the scale shown, 0—meaning good nutrition, 1—fair, 2—poor, and 3—very poor. This grading is in general terms and rests upon the opinion of the physician. As soon as more exact standards for rating nutrition are available they should be utilized.

Height—Record to nearest inch, children being measured without shoes.

Weight—Record to nearest pound, sweaters, coats and extra wraps of course being removed. (Weight should be with ordinary indoor clothing.)

Standard Weight—Record to nearest pound, taking figure from Wood-Baldwin height-weight-age tables or other more accurate tables when available.

*Per cent Deviation + or — —*Record in round numbers after computing per cent above or below standard, thus — 6 or + 10.

Posture—Record in terms of the scale. The examiner's judgment must determine the ranking. When nationally accepted standards of rating posture are available they should be used.

Teeth—Record in the general terms of the scale.

Nose-Throat—Record in terms of the scale; the decision being made on the history

(see Recurrent Tonsillitis and Rheumatism at top of card) in conjunction with what is visible from the direct examination.

No separate columns are provided for tonsils or adenoids or mouth breathing or enlarged cervical glands. A specialist to whom the child may be taken by parents will, of course, make his own deductions and it is sufficient in the school examination merely to direct general attention to this area.

Special care is advised in marking this item. There has developed a tendency to mark tonsils on appearance alone. This is a questionable procedure. Something of the history as well as size and appearance should be obtained before definitely designating a defect. Where this is difficult to obtain, and yet the appearance of the tonsils is unfavorable, it is recommended that the symbol 1 (slight) be favored in preference to a 2x. The designation of 2x sets in motion a chain of events involving expense and is also capable of creating misunderstanding between the school physician on the one hand and the parents and family physician on the other. It is true that the child's welfare must not be neglected in the effort to prevent misunderstanding. At present, however, it would seem that tonsil defects are magnified, over-emphasized and reported too freely rather than the reverse.

The experience of teacher and parent will be helpful in detecting adenoids or mouth breathing. Likewise the child's absence records from colds (at the bottom of the card) will be helpful in the later examinations.

Heart—Record in terms of the scale. Unless it is permissible to bare chest and back to make the stethoscopic observation this item should be omitted. An inspection that is so superficial as to be without significance is not justified.

Where suspicious signs are present, a test for rate of pulse recovery may also be made.* The experience of teacher and parent with the child's actions may also be found helpful in supplementing the evidence the physician is able to get directly.

Vision—Record in terms of the scale. It is presumed that the Snellen or equivalent test for visual acuity will be used. If a defect is indicated in either eye, it should be noted. It is not necessary to show on the card the rating of each eye independently. The ophthalmologist who later examines the child will draw conclusions from his own examination, and further detail in the routine school examination will not be necessary.

Hearing—Record in terms of the scale. The whispered voice test is probably used most commonly. The use of the audiometer with which an entire classroom may be tested at once is recommended where the volume of work is such as to warrant the expense of the instrument. This is manufactured and sold by the Graybar Electric Co., Graybar Building, Lexington Avenue and 43d Street, New York, N. Y.

Thyroid—Record in terms of the scale.

Other—Note here any other outstanding matter of importance not already listed.

General—The back of the card may be used to record special details in connection with the examination if this is desired.

It is recommended also that supplementary instruction sheet be prepared locally to help interpret the meaning of the code terms—"slightly," "moderately," "markedly" unsatisfactory. Thus, in the case of vision, it might be explained that inability to see the 20/20 line but yet reading the 20/30 line would be marked 1. Reading the 20/30 but not 20/40 would be marked 2 and inability to read 20/70 line as 3.

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* See procedure in Pittsburgh schools, Dr. Harry Burns, Medical Director.

The Marking Code—The scale for marking shown on the card is largely self-explanatory. Its use is advised for the sake of uniformity and understanding. The grading marks 1, 2 and 3, will, of course, vary with the subjective impressions and diverse methods of individual physicians. As rapidly as reliable standards are developed they should be utilized.

Mark 2 " present," implies a condition more marked and positive than 1. An item marked 2 — should ordinarily be referred to the family physician for further medical advice. However, there are instances where it is inadvisable to follow up this condition with home visits by the nurse. For that reason the character x is reserved as a follow-up symbol, a signal for the nurse to " go ahead " with the case.

Mark 3 is reserved for conditions demanding special or immediate attention. Almost invariably an x would appear with the 3. The special marking of certain cases with a 3 enables the nurse to give them precedence in mapping out her visiting schedule.

Where there has been a previous correction, use the symbol 00, which indicates something different from normal but still not necessarily a defect.

Use — to indicate information sought but not obtained to distinguish from a blank space which would indicate no information sought.

If no mark is made, and the space is left blank, succeeding teachers will be puzzled to know whether the result was negative or whether no observation was made. The maximum value of this card to succeeding teachers is the completeness of the record which comes to them. If it is incomplete, succeeding teachers will not be inclined to place dependence on the record.

N—is a symbol to indicate that the family has been notified of the findings.

/—A diagonal line from lower left to upper right corner of square, and through the defect record, indicates that the school examination was not verified by the family physician.

×—A cross over the entire space, made over the record of a defect, indicates that the matter is receiving professional attention.

These last two marks would represent a termination of the case for that individual item, so far as the nurse is concerned.

The uncrossed off x's represent the remaining work for the nurse.

Absence Record—In the lower part of the card is space for noting the absence record. There are wide columns for each of 7 school years. These columns are divided into two parts, so that absence for each term may be recorded.

The entries in this space are to be made at the end of the term. They represent the summation of the daily experience. They are taken from the Class Room Register on which must be kept the detailed cause of absence in terms of the code indicated on the card.

On the Class Room Register, in place of marking an A for absence it is recommended that a dot (.) be made. When the child returns to school with an excuse or the cause of the absence is otherwise determined, the teacher can then write on top of the dot the appropriate letter indicating the class of absence, whether C, D, S, E, M. As described in succeeding paragraphs all absences can be recorded under one of the five headings. The groups are distinct and their titles self-explanatory and mutually exclusive and the designating letter is purposely made suggestive.

At the end of the term the numbers of each letter showing on the register can be totalled and recorded on the health card.

While this practice involves slight additional work, the securing of accurate information as to the amount, nature and location of illness enables the teacher to understand better the causes of absences, and this in time is of assistance in promoting health and preventing illness. This is as definite a contribution as the discovery and elimination of physical defects.

School Year—Record the years the child has been in school. Thus the child may be in the third grade but, having at some time repeated a grade, this is really his fourth school year.

Name of School—Designate school by name or number.

Grade and Age—Place grade number above, and age in years below, the diagonal line.

Number Registration Days for Child—This is entered for each term. This number may differ somewhat among the children of the class as some children may have entered school after the beginning of the term.

Absence—Total Days—At the end of the term, record here the total days absent. Count half days absence as one-half.

The entries C, D, S, E, M are subdivisions of the total and their sum should equal the total. The purpose of the subdivision is to convey to subsequent teachers the nature of the absences, for these have differing health significance. Twenty days' absence is not of health significance if due to absence from town on a visit, or to exclusion from school not because of the child's illness but because of exposure to another child with some communicable disease. This information on sickness and its nature will prove of value to subsequent teachers in their dealings with and understanding of individual children. The summation of these causes of absence by room and by schools will also be of value to principals and superintendents administratively.

Entries by cause—C, D, S, E, M.

Five distinct classes of absences are recognized, viz.:

(C) Colds and Sore Throat
(D) Disease, Communicable (specific infections)
(S) Other sickness
(E) Exclusion because of exposure to Communicable Disease
(M) Miscellaneous Causes, not sickness of the child

(C) *Colds and Sore Throat*—Under the heading (C) record colds, sore throat and complications associated with colds such as tonsillitis, bronchitis, laryngitis, pharyngitis, influenza, pneumonia.*

(D) *Disease, Communicable*—(so-called diseases of childhood)—This refers to specific communicable disease for which isolation or quarantine are prescribed, such as measles, mumps, chicken pox, whooping cough, German measles, scarlet fever, diphtheria, typhoid, poliomyelitis, smallpox. It also includes transmissible infections such as impetigo, scabies, ringworm and pediculosis.

(S) *Sickness*—(symptomatic, including injuries)—Include here all other sickness not covered by the two items above. For instance, headache, stomach ache, toothache, broken arm, burns, etc.

(E) *Exclusion, Exposure to Communicable Disease*—This is reserved for those absences which are enforced by the school in order to protect other pupils. In this case the child is not ill but is kept from school because of a known exposure to a case of communicable disease. If the child thus excluded contracts the disease,

* Influenza and pneumonia are arbitrarily placed under this heading even though there is good reason for including them under D.

the days' absence following the diagnosis of the disease should be recorded in the register as (D).

(M) *Miscellaneous causes not illness of the pupil, other than above*—This designates absence to go shopping or visiting, to see the oculist or dentist, or to stay at home with a sick parent, or to mind the baby, etc. In other words, the child is not ill, nor is he kept from school because of exposure to communicable disease. This type of absence may account in some instances for one-fifth to one-half of all absences and in epidemics has been known to go as high as 90 per cent of all absence.

SCHOOL HEALTH FORM 2

Name _____ Sex _____ Color _____ Birth Date _____ Parent or Guardian _____

Addresses	Date	Diseases	Year	Diseases	Year	Diseases	Year	Immunization	Date	Age
		Chicken Pox		Smallpox		Rheumatism		Diphtheria—3d TAT		
		Diphtheria		Typhoid		Chorea		Final Neg. Schick		
		Measles		Whooping Cough		Malaria		Typhoid—3d Dose		
		Scarlet Fever		Recur. Tonsillitis		Hookworm		Smallpox—Successful Vac.		

(underline) Revac. Pos. Neg. Im. Reaction Date

PHYSICAL EXAMINATION — If Tb in family, who (relation)

Grade	Date	Parent Present (yes or no)	Nutrition	Height	Weight	Std. Weight	Per cent Deviation + or −	Posture	Teeth	Nose-Throat	Heart	Vision	Hearing	Thyroid	Other

Code: 0—Satisfactory; 1, 2, 3—Slightly, moderately, markedly unsatisfactory; 00—Previous correction; X—Needs medical or dental attention; — No information obtained; N—Family notified; / across entire space, not verified by family physician; X across entire space, receiving professional attention

School Year													
Name of School													
Grade and Age	/	/	/	/	/	/	/	/	/	/	/	/	/
Number Registration Days for Child													
Absence—Total Days													
(C) Colds and sore throat													
(D) Disease, Communicable													
(S) Sickness, other													
(E) Exclusion exp. to com. dis.													
(M) Misc. causes other than above													

(This space for printing City and Agency)

NOTE: The form is printed to conform to the type page of the JOURNAL. It shows the content but not the exact spacing on the card.

The Problem of Finance in Rural Health Practice*

DOUGLAS L. CANNON, M. D.

Assistant State Health Officer, Montgomery, Ala.

THE governor of Alabama, on September 27, 1923, approved an act of the legislature making available $55,000 as a state-aid fund for county health work. This sum was sufficient at that time to subsidize 22 counties not in a position to carry the entire burden of providing health service for their people. Participation in the fund was made contingent upon the appropriation by a county of a sum of money sufficient to secure a permanent health organization and adequate to do effective work, the amount in each instance to be determined upon the advice and with the approval of the State Board of Health. A further act of the legislature, approved August 26, 1927, provided a subsidy of $2,500 per county for all counties not already receiving state funds for local health work, on condition that these counties make available an appropriation in accordance with the terms specified above.

When the organized counties numbered 33, October 1, 1927, the State Board of Health was aware of the fact that of the 34 counties not then receiving full-time health service only a very few were financially able to make the minimum appropriation of $5,000 theretofore required in order to participate in the county organization fund. On the other hand, among the 34 were a number urgently in need of a well planned and continuous program of health preservation and disease prevention. Therefore, to arrive at a figure that even the poorest counties could meet in order to enjoy the benefits of the fund, two plans suggested themselves. The first was on the basis of the per capita appropriation being made by those counties essentially like the group remaining to be organized. There were 21 such counties, no one of them with a municipality exceeding 10,000 population, the majority without a municipality in excess of 5,000, and 9 altogether rural. This study revealed the average per capita appropriation to be 17.75 cents. The range was from 10.49 cents to 24.15 cents.

* Read before the Health Officers Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

When the average was applied to the populations of the existing unorganized counties it was found that the appropriations which the State Board of Health might have a right to expect varied from $2,360 in the least populous county to $6,354 in the most populous. The results were not altogether satisfactory. In most instances they represented a need for health work rather than ability to pay. Knowledge of local conditions and character of population justified this conclusion.

It seemed advisable then to determine what the per capita appropriation would mean in terms of tax rate, the assessed valuation of property in the several counties as given in the latest report of the State Auditor being used as a basis. The study of this relationship showed that an appropriation could not be calculated solely on the basis of the average per capita as determined for the organized counties.

To proceed upon such a plan would mean that the appropriation of County A would be equivalent to a tax rate of 7.46 cents per $100 of property as assessed; that of County B, 7.09 cents; County C, 7.75 cents; and of County D, 7.21 cents. Obviously such rates were too high.

The question then arose as to what would be a reasonable rate to apply. To arrive at a solution (the second plan), the average appropriation in cents per $100 of property as assessed, in the group of organized counties used above, was determined. The average was found to be 4.95 cents. To avert criticism from the organized counties that less was being expected of the unorganized—$5,000 having been the minimum amount theretofore approved by the State Board of Health if a county participated in the county organization fund—it seemed wise to exceed the average in arriving at the ideal rate.

How far above the average, though, should the ideal be? It was known, for example, that several of the organized counties making an appropriation approximating 6.5 cents per $100 of assessed property found it difficult to meet the appropriation. Somewhat arbitrary reasoning then seemed to indicate that the ideal should lie between 4.95 and 6.5 cents. As a trial procedure, 5.5 cents was chosen. When this was applied to the property assessments in the unorganized counties, a given county's appropriation of $2,360 on the per capita basis became $1,765 on the property assessment basis, a greater difference than might be apparent without the knowledge that the population of the county in question is 13,300 and the assessed property but little more than $3,000,000. In the case of a second county, $6,354 became $6,152, a negligible difference because the county has property assessed in excess of $11,000,000.

COMMENTS

The Alabama State Board of Health is of the opinion that adequate service cannot be rendered by a county health department that has a smaller personnel than 3, or an annual budget of less than $7,000. Of this amount the State Board of Health is in position to contribute $2,500 from the county organization fund. Unless an arbitrary standard of coöperation is adopted, with the state bearing much the larger share of the burden, it would remain for a county to make a minimum appropriation of $4,500.

The study made of the ability of the unorganized counties to pay for health service revealed that only 7 of the 34 could attain this figure. If, therefore, these less fortunately situated counties are to receive approved health service, means must be provided to care for the deficit after the county organization fund and the local appropriation have been made available.

An equalization fund is not unknown in the operation of certain departments of state government. It should not be unknown in the operation of a health department. State-wide health service, at least in the South, can hardly be attained unless such a fund is set aside to aid counties as equally deserving as others but not able to make more than a small part of the total appropriation needed for adequate protection. Fortunately Alabama has been able to have the equivalent of an equalization fund. This has been made possible through the use of a portion of the money appropriated by the legislature for the general operating expenses of the State Board of Health, together with subsidies from extra-state agencies. When these extra-state subsidies have been withdrawn, an equalization fund must become a reality by legislative enactment.

Finally, the problem of finance, if initially acute, is likely to remain acute over the second and third years of the county health department's life. Normal expansion of work must be provided for. Adequate salary increases must be granted, if stability of organization is to be maintained. To assure these there must be an annual increase in appropriation, certainly after the second year. The source of the added revenue remains to be determined, but sound administrative policy would seem to direct that it be derived from county funds.

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THE HEALTH OFFICER'S TENURE OF OFFICE

IT IS not possible to prevent completely all changes in the personnel of health departments, either local or state. Our "In Memoriam" resolution at the Chicago meeting included the names of forty members who had died during the year, of whom fifteen were health officers or health commissioners. Since all health officers are not members of our Association, the actual number of health officials who died is probably considerably in excess of fifteen, death causing a number of vacancies which must be filled.

In addition, quite a number of officials return to the practice of medicine or take up some other work which promises freedom from political interference and worry, or more adequate financial returns, better prospects, or some other advantage of sufficient weight to bring about a change in vocation.

Many health officials have been removed because of a change in the dominant political party or through some supposed indiscretion. There are some such cases on record which remind one of the rise and fall of court favorites in Europe in the 17th century. This statement is not made to justify all acts of health officers. Being human, they are capable of error, and, like other people, often make mistakes. In some cases their removal has been justifiable, but in others it has not

Time is an element in success in health work, and the tenure of office of the average health officer is altogether too short. A report made last October showed an annual turnover of health officers amounting to 14 per cent. This must have meant the slowing up of work, or disturbance of programs for betterment, in many communities. Uncertainty of tenure is apt to cause hesitancy or unwillingness on the part of the health officer to launch a program requiring time for its accomplishment. When the officer is reasonably sure that his ten-

ure of office will be brief, it is almost certain to interfere with his activities and to make him doubtful of the wisdom of initiating measures which require the longest possible period of time for their accomplishment.

The Executive Board of our Association recently sent the following significant message to one of our governors:

> The American Public Health Association has long recognized that the security of health protection to the people, the continuity of constructive health programs, and the efficiency of the service are seriously hampered by the frequent shifting of the administrative head of the health department. The Association has also found that where the employment of the administrative head or health officer is in the hands of a board of health or council of members interested in public health, appointed for overlapping terms, sound policies have been established and effective service continuously rendered. For these reasons the Association through its Executive Board urges that you take steps at an early date to assure to the people of your state the benefits of such a policy.

In the instance which brought out this resolution, a change in the office of health commissioner was unavoidable, but we are glad to say that the new appointee was a physician who had had wide experience as a health administrator, and who will, with little or no break, continue the policies and programs so successfully adopted and pushed by his predecessor. We wish that all changes in state health officers could be accomplished with as little disturbance and detriment to the welfare of the people as in this case.

YELLOW FEVER AWARDS

NEARLY 28 years after the demonstration of the agency of the Stegomyia (*Aëdes aegypti*) mosquito in spreading yellow fever,[1] the Congress of the United States has finally given official recognition to this great piece of work and provided a pension of $125 a month to the 16 of those now living who took part in these dangerous experiments, and to the widow of one. In addition, a gold medal will be given to each of the living and to the representatives of those now dead.

The Yellow Fever Commission consisted of Walter Reed, James W. Carroll, Jesse W. Lazear and Aristides Agramonte. Dr. Lazear died of yellow fever after having allowed himself to be bitten by a mosquito. Dr. Carroll, who also allowed himself to be bitten, was seriously ill, but recovered, though some remaining disability is believed to have played a part in his death later. Dr. Reed did not contract yellow fever, and died of appendicitis some years after his return to the United States. Dr. Agramonte, who was an immune, is the only member of that famous Commission now living.

The story of their work has often been told, but cannot be too often repeated. Only those who have lived in those parts of the country formerly visited more or less frequently by yellow fever can appreciate what the disease meant in terror, human suffering and financial loss through interruption of commerce. Fumigation directed toward the extermination of insect carriers is now employed instead of the former disinfection intended to kill the supposed germ. Our ports are now open to ships from any part of the world throughout the year. No longer are vessels tied up at quarantine for weeks and months. Never again will yellow fever be epidemic in any city of our country. The benefits of the discoveries of the Yellow Fever Commission have been extended to every part of the world in which the disease has existed. Its work has been recognized by scientific men everywhere, and abundantly confirmed, not only by foreign commissions, but also in practice.

We rejoice that Congress has finally responded to the urgent representations made for years past and recognized not only the men who directed the work, but those more humble ones who offered themselves for experimental purposes. No greater courage has ever been shown in war or in peace than was displayed by these men.

We regret the necessity of introducing a discordant note, but must call attention to the miserly pittance granted to those through whose agency thousands of lives have been spared and millions of dollars saved. The richest country in the world could well afford adequate recognition of such notable services. However, it marks the beginning, and we may confidently hope that in the future similar services will be more promptly and more suitably rewarded.

We cannot close without mention of the further extension of our knowledge of yellow fever by devoted men working in West Africa, four of whom have given their lives as the price. The findings of our Army Commission have been further confirmed, and there is hope that a vaccine has been developed which will protect those carrying on such studies as well as others who may be exposed through the exigencies of their calling.

REFERENCE

1. The Etiology of Yellow Fever—A Preliminary Note. *Proc. 28th Annual Meeting A. P. H. A.*, October, 1900.

58TH ANNUAL MEETING OF THE A. P. H. A.

Minneapolis, Minn., September 30 to October 5

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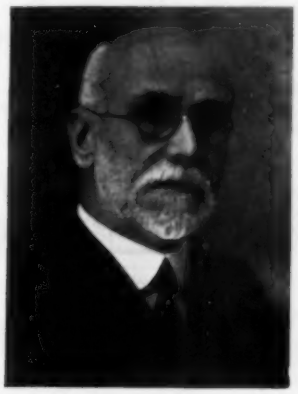
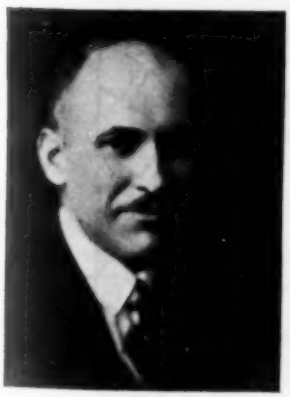
Chairman



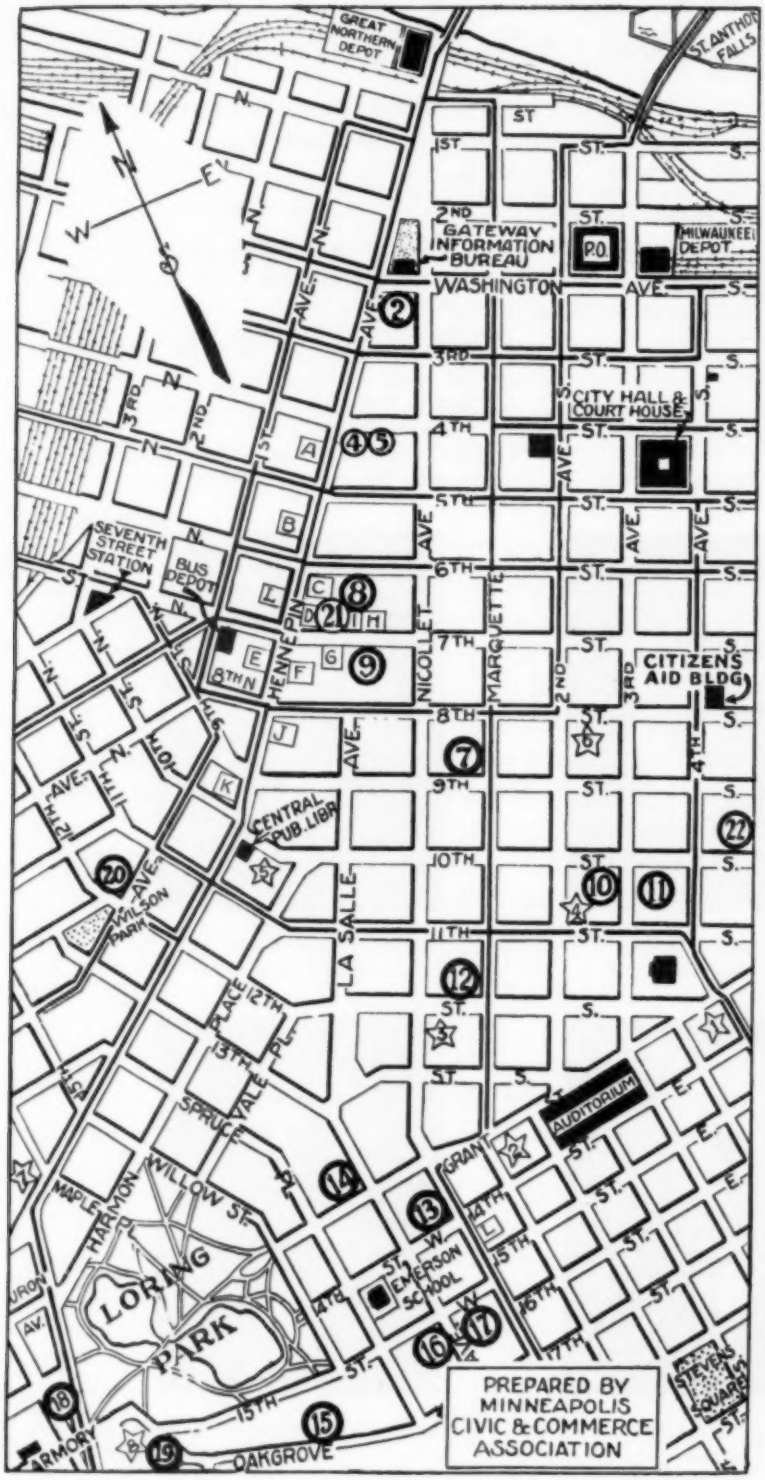
RICHARD OLDING BEARD, M.D.
Executive Secretary



C. W. SHIRK
Member

FRANCIS E. HARRINGTON, M.D.
Member

LOOP DISTRICT OF MINNEAPOLIS



HOTELS

2—Nicollet
4—Andrews
5—Vendome
8—Dyckman
21—Majestic
9—Radisson
7—St. Regis
20—Hastings
22—Francis Drake
10—Leamington
11—Curtis
12—Sheridan
14—Maryland
13—Kenesaw
17—Bedford
16—Buckingham
15—Oak Grove
19—510 Groveland
18—Plaza

THEATRES
(*Squares*)

A—Palace
B—Unique
C—Aster
D—Grand
I—Strand
H—Garrick
G—Seventh Street
F—Lyric
E—Pantages
J—State
K—Hennepin Orpheum
9th St. & LaSalle Avenue
New Minnesota Theatre

CHURCHES
(*Stars*)

6—Church of Redeemer
5—First Baptist
4—Second Church Scientist
3—Westminster Presbyterian
1—Central Lutheran
2—Wesley M. E.
8—St. Mark's
7—Basilica of St. Mary

ASSOCIATION NEWS

MINNEAPOLIS HOTELS

FOR the convenience of delegates, a number of Minneapolis hotels are listed with their rates. A map appears on page 542 showing the location of these hotels and their proximity to the Auditorium, where all the technical sessions and the exhibits will be held.

It is advisable to engage rooms in advance of the meeting, and a reservation blank is printed on page 545 for that purpose.

All applications should be made directly to the hotels.

HOTEL RATES

Hotel	*Address*	*Room Capacity*	*One Person*		*Two Persons*	
			With Bath	*Without Bath*	*With Bath*	*Without Bath*
Curtis	10th St. & 4th Ave. S.	825	$2.00–3.00	.....	$3.00–6.00	.....
Nicollet	Wash. at Henne. & Nicollet Aves.	600	2.50–6.00	$2.00	4.00–8.00	$3.50
Leamington	3d Ave. S. & 10th St.	500	2.50–6.00	.....	4.50–10.00	.....
Radisson	7th St. Bet. Henne. & Nicollet Aves.	500	3.00–6.50	2.00–2.75	5.00–30.00	4.00
Sheridan	Marquette Ave. & 11th St.	457	2.50–3.50	1.50–2.00	3.50–5.00	2.50–3.00
Andrews	Hennepin Ave. & 4th St.	329	2.50–6.00	2.00	4.00–7.00	3.00
Dyckman	6th St. Bet. Henne. & Nicollet Aves...	300	2.00–5.00	.....	4.00–7.00	.....
Vendome	4th St. Bet. Henne. & Nicollet Aves.	250	1.75	1.25–1.50	3.00	2.00–2.50
Oak Grove	230 Oak Grove St.	200	3.00–3.50	.....	4.50–5.00	.....
Maryland	LaSalle Ave. & Grant St.	172	2.00–3.00	.....	3.00–15.00	.....
Plaza	Hennepin Ave. & Kenwood Parkway	160	2.50–6.00	.....	3.50–6.00	.....
Francis Drake	10th St. & 5th Ave. S.	150	2.50–5.00	.....	3.50–6.00	.....
Hastings	12th St. & Hawthorne Ave.	150	1.75–4.00	.....	2.50–5.00	.....
Buckingham	LaSalle Ave. & 15th St.	138	3.00–6.00	.....	4.00–7.00	.....
Russell	16 S. 4th St.	125	1.50–2.50	1.25–1.50	2.50–4.00	2.00–3.00
Majestic	7th St. & Hennepin Ave.	112	1.50–2.00	1.00–1.50	2.50–3.00	1.75–2.00
510 Groveland	510 Groveland Ave....	110	4.00–15.00	.....	6.00–17.00	.....
Bedford	1501 LaSalle Ave.	100	2.00–3.00	.....	3.00–4.00	.....
Kenesaw	14th St. & Nicollet Ave.	100	2.00	1.25–1.50	3.00	2.50
St. Regis	Marquette Ave. & 9th St.	58	1.50–3.00	.....	2.50–4.00	.....

NATIONAL SAFETY CONGRESS

The National Safety Council and the American Public Health Association meet this year in the same week, the former in Chicago, the latter in Minneapolis. As Chicago is en route to Minneapolis, it will be possible for physicians and public health workers interested to include sessions of the National Safety Congress in their week's program. The medical sessions of the National Safety Congress come on Monday and Tuesday, and possibly Wednesday, whereas the A. P. H. A. Industrial Hygiene sessions in Minneapolis will take place on Thursday and Friday.

DR. BISHOP HONORED

E. L. Bishop, M.D., Commissioner of Health, Nashville, Tenn., Secretary of the Health Officers Section, A. P. H. A., has been appointed a member of the Board of Scientific Directors of the International Health Division of the Rockefeller Foundation. The other members of the board are: F. F. Russell, M.D., General Director of the International Health Division; Rufus Cole, M.D., the Rockefeller Institute; Louis I. Dublin, Ph.D., the Metropolitan Life Insurance Company; Wade H. Frost, M.D., Johns Hopkins School of Hygiene and Public Health; W. G. Smillie, M.D., Harvard School of Public Health; and C.-E. A. Winslow, Dr.P.H., Yale School of Public Health. This group will give expert advice concerning budgets, policies and programs, and with regard to certain activities will serve as a special executive committee with delegated authority.

VIRGINIA PUBLIC HEALTH ASSOCIATION

The Virginia State Public Health Association held its annual meeting in Richmond, Va., February 20. The following officers were elected for the year 1929: *President,* W. B. Foster, M.D., Richmond; *1st Vice-President,* W. H. Pott, M.D., Norfolk County; *2d Vice-President,* G. F. McGinnis, M.D., Richmond; *Secretary-Treasurer,* Fred J. Wampler, M.D., Richmond; *Representative to the A. P. H. A.,* M. G. Perrow, Lynchburg.

NEW MEMBERS

Joseph M. P. Allaire, M.D., Joliette, P. Q., Health Commissioner

Harold E. Babbitt, M.S., Urbana, Ill., Professor of Sanitary Engineering, University of Illinois

William E. Ayling, M.D., Syracuse, N. Y., Health Supervisor of School Children

M. B. Beckett, M.B., Saginaw, Mich., City Physician and Assistant Health Officer

J. William Boren, M.D., Marinette, Wis., City Health Commissioner

J. Adelard Boucher, M.D., Watertown, Mass., Health Officer

Alice Britton, R.N., Charleston, W. Va., Public Health Nurse, Kanawha County Health Unit

Edward F. Brown, New York, N. Y., Director, Diphtheria Prevention Commission, City Department of Health

Ira C. Brown, M.D., Seattle, Wash., Medical Inspector, Public Schools

Joseph A. Chapman, B.Sc., New York, N. Y., Clinical Pathologist, Chapman's Pathological Laboratory

Raymond S. Crispell, M.D., Kingston, N. Y., School Physician

Jess L. Cunningham, R.N., Beckley, W. Va., Health Nurse, Raleigh County

Paul M. Drake, M.D., Coquille, Ore., Coos County Health Officer

Ashton W. Ecklund, B.Sc., Bismarck, N. D., Instructor in Hygiene and Sanitation in local hospital

Heward E. Elmer, B.S., Detroit, Mich., Bacteriologist, Owen Clinical Laboratory

Robert C. Farrier, M.D., Homer, La., Director, Claiborne Parish Health Unit

C. B. Finefrock, M.D., Port Clinton, O., Health Commissioner, Ottawa County

John S. Fulton, M.D., Emporia, Kan., County Health Officer

Beulah Gerber, Painesville, O., City and Township School Nurse

Ollie M. Goodloe, B.S., Booneville, Ky., Director, Owsley County Health Department

Arthur H. Graham, M.B., D.P.H., Montgomery, Ala., District State Health Officer

G. Webster Hallett, Osterville, Mass., Member, Local Board of Health

Charles F. Herm, Daytona Beach, Fla., Clinical Pathologist (Assoc.)

William C. Humphries, M.D., Griffin, Ga., Commissioner of Health, Griffin and Spalding County

Laura E. Jones, M.D., Syracuse, N. Y., Examining Physician, Solvay School System

Thomas Kelly, V.M.D., Philadelphia, Pa. (Assoc.)

Jonas E. King, M.D., Girard, O., Health Commissioner

Alvin Kirmse, M.D., Tucson, Ariz., City Health Officer

Richard C. Leonard, Fargo, N. D., Director, School Dental Program

Vivian E. Linden, Alhambra, Calif., Public Health Nurse, Los Angeles County Health Department

Eugene R. Linklater, M.D., Kenmore, N. Y., Health Officer

Frank E. McCord, M.D., Topeka, Kan., County Health Officer

Charlotte McLoughlin, R.N., Charleston, W. Va., Public Health Nurse, Kanawha County Health Unit

Louis Mendelsohn, M.D., Saratoga, Calif., Deputy Health Officer, Santa Clara County

Henry A. Mentz, Hammond, La., Consulting Engineer

S. C. Moore, M.D., Cadillac, Mich., Health Commissioner, Wexford County

Charles F. Neergaard, New York, N. Y., Hospital Consultant (Assoc.)

Arthur W. Newitt, M.D., Birmingham, Mich., Health Officer

Helen L. Palliser, M.D., Poughkeepsie, N. Y., Medical Inspector of Schools

Edward W. Pape, Lakewood, O., Teacher of Biology, Lakewood High School

Julius Pizzoferrato, Steubenville, O., Health Commissioner

Arthur O. Ratliff, Charleston, W. Va., Sanitary Engineer

Richard E. Reinke, B.S., Atlanta, Ga., Sanitary Engineer

Horace M. Roberson, M.D., Cleveland, Tenn., Health Officer

J. N. Rosenberger, V.M.D., Philadelphia, Pa. (Assoc.)

Henry C. Schumacher, M.D., Cleveland, O., Director, Child Guidance Clinic

C. Morley Sellery, M.D., Los Angeles, Calif., Temporary Assistant Director, Dept. of School Health

H. B. Senn, M.D., Beaufort, S. C., County Health Officer

Mrs. Romaine E. M. Smart, New Haven, Conn. (Assoc.)

Mrs. June Snell, R.N., Morgantown, W. Va., County Nurse

Mitchell B. Stock, Bridgeport, Conn., Public Health Engineer, Nustone Products Corp.

Normal R. Sullivan, M.D., Santa Cruz, Calif., City Health Officer

Louis-Rene Vezina, M.D., D.P.H., Terrebonne, P. Q., County Medical Officer of Health

DECEASED MEMBERS

Robert M. Boyd, M.D., Fort William, Ont., Can. Elected member 1926

F. B. Forbes, Boston, Mass. Elected member 1905

L. W. Leiter, D.Sc., Baltimore, Md. Elected member 1928

..... (*Cut off on this line*) .....

HOTEL RESERVATION BLANK

To .....
(Name of Hotel)

Please reserve for me.....rooms for.....persons for the A. P. H. A. Meeting. (Cross [X] is placed after my preference.)

Single room.....Double room.....

Maximum rate per day for room $.....Minimum rate per day for room $.....

I expect to arrive..... If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street Address .....

City ..... State .....

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Making a Morbidity Survey—In 1925, J. V. DePorte, M.D., Director of the Division of Vital Statistics of the New York State Health Department, outlined a project for obtaining morbidity statistics through direct reporting by attending physicians. In 1927 the active interest of 150 physicians having been secured, a survey was commenced which lasted for 12 months. One hundred and seven physicians serving a population of about 101,000 reported 98,069 cases of sickness.

The list of causes of illness must be brief since a busy rural practitioner cannot be asked to give the time necessary to fill out a blank containing all of even the more important types of sickness. The subdivisions were limited to sex; no provision was made for age, occupation and other facts of personal history, or for the duration and severity of illness. One proposed and very desirable heading, "All Other Types of Illness," which would have given a picture of the entire morbidity situation, had to be omitted

SUGGESTIONS FOR REPORTING

In using the form on the reverse side of this card please follow the directions carefully.

Use the card daily, putting a mark for each *new* case. Thus

Disease	Males	Females
Tonsillitis	///	//

And as further new cases are seen, simply add to the check marks, thus

	////	////

The value of this record lies in its completeness; it is therefore important to send in the card weekly, even when NO new cases of the specified disease are seen.

Under "Colds" enter bronchitis, coryza, "grippe," laryngitis, pharyngitis and similar conditions.

Under "Children, diseases of" enter all forms that are at present not reportable or shown elsewhere on the card; for instance rickets, pyelitis, malnutrition, etc.

Under "Neuroses" include conditions such as "worry," "indigestion," "neuritis," any condition that is in your opinion based on a functional disturbance of the nervous system.

Under "Surgical" enter operations for any cause, injuries due to accidents, etc.

11-23-26-5000 (21-2953)

SICKNESS REPORT: Week ending..... 192

The number of *NEW CASES* attended by me during the week ending Saturday midnight was as follows:

Disease	Males	Females
Appendicitis		
Arteriosclerosis		
Cancer		
Children, diseases of (outside of reportable and those listed on this card)		
Colds		
Diabetes		
Diarrhea and enteritis (under 2 years)		
Digestive disorders, other		
Gonorrhea		
Gynecological cases:		
a. Operative		
b. Non-operative		
Heart disease		
Neuroses		
Nephritis, acute		
Nephritis, chronic (Bright's disease)		
Rheumatism:		
a. Acute rheumatic fever		
b. Chronic arthritis		
Surgical cases operative, traumatic (except gynecological)		
Syphilis		
Tonsillitis		

(Signed)

..... M.D.

P.O.....

IMPORTANT Please mail report IMMEDIATELY even if NO NEW CASES of above named diseases were attended.

because certain physicians preferred not to disclose the general extent of their practice.

The physicians were asked to report only new cases of the various types of sickness indicated and not new patients, and were furnished stamped and addressed envelopes in which to return the cards to the State Health Department each week.

Results of the study made in New York State were reported by Dr. DePorte in the *Journal of the American Medical Association*, Feb. 16, 1929.

A Continuous Appraisal—George D. Lummis, M.D., Health Officer of Middletown, O., submits a leaf from a book which lies on his desk at all times. It gives a complete statistical record for the year 1928, and by a glance he can answer almost any question which may be directed to him. In this book are also kept the records of all reportable diseases, the laboratory reports on milk, a sheet showing mortality and morbidity for each month, the number of deaths and births, also the five leading diseases, the number of cases reported and deaths therefrom. From this he is practically able to complete his *Ap-*

PAGE GIVING 1928 STATISTICS

DEATHS 1928

Causes	Under 1 mo.	1 mo.–1 yr.	1–5	5–10	10–20	20–30	30–40	40–50	50–60	60–70	Over 70	Male	Female	Colored	Foreign	Total
Heart Disease	2			1	2	3	1	10	22	14	11	30	36	6	5	65
Pneumonia	3	20	9	3	2	4	4	1	3	1	11	35	26	15	2	61
Apoplexy						1	2	2	4	11	17	13	24	3	1	37
Nephritis				1		1	2	2	3	5	7	12	9	7		21
Cancer					1		1	1	6	6	5	5	15	1	3	20
Premature Birth	17	2										11	8	3		19
Gastroenteritis		15	3	1								15	4	1	1	19
Tuberculosis, Pulm.				1	1	6	1	3	3		1	7	9	2		16
" Other		1		3	1	1	1					4	3	2		7
Arteriosclerosis										3	8	4	7	1	1	11
Auto Accidents			2	2	1		3				1	8	1	1		9
Homicide						2	1	1	3			7		2		7
Accident of Birth	5		1				1					4	3			7
Diabetes									1	3	1	4	1			5
Influenza		1		1			2					3	1	1		4
Septicemia			1		1	2			1		1	6				6
Accident		1		1			1		1			4				4
Scarlet Fever			2		2							4				4
Burns						1	2					3		2		3
Puerperal Sept.						1	1						2			2
Suicide							1			1		1	1			2
Hernia									1	1		1	1			2
R. R. Accident						1		1				2		1		2
Pernic. Anemia									2				2	1		2
Typhoid Fever						2						2		1		2
Mastoiditis			1		1							1	1			2
Whooping Cough			2										2			2
Appendicitis						1						1				1
Alcoholism									1			1				1
Gall-stones									1				1			1
Atrophy of Liver								1				1				1
Asthma										1		1				1
Pancreatitis									1			1				1
Strychnia Poison			1										1			1
Tetanus				1								1				1
Peritonitis						1							1	1		1
Puerp. Nephritis								1					1			1
Intest. Obstr.			1										1			1
Meningitis				1								1		1		1
Stillborn												20	18			38
Total	27	40	23	16	12	27	24	23	53	46	63	193	161	52	13	354

Estimated Population 34,000 Death Rate per 1,000 *10.4*

REVERSE OF STATISTICAL PAGE SHOWN ON PAGE 547

DEATHS BY WARDS 1928

Ward	1st	2d	3d	4th	Total
Male	7	48	53	85	193
Female	10	41	50	60	161
Total	17	89	103	145	354

Death Rate 10.4

BIRTHS BY WARDS 1928

Ward	1st	2d	3d	4th	Total
Male	29	103	123	219	474
Female	28	110	118	190	446
Total	57	213	241	409	920

Birth Rate 27

DEATHS AND BIRTHS PAST 10 YEARS

	Deaths	Rate	Births	Rate
1919	253	11.5	692	31.5
1920	262	10.9	788	32.8
1921	242	9.7	737	29.5
1922	264	9.4	822	30.4
1923	278	9.9	847	30.2
1924	271	9.3	863	29.5
1925	269	8.9	855	28.5
1926	311	10.0	872	28.1
1927	278	8.7	858	27.0
1928	354	10.4	920	27.0

INFANT MORTALITY PAST 10 YEARS

1919	72
1920	69
1921	61
1922	70
1923	74
1924	67
1925	61
1926	69
1927	56
1928	73

REPORTABLE DISEASES 1928

	Cases	Deaths
Tuberculosis, Pulm.	34	16
" Other	7	7
Diphtheria	18	0
Small Pox	72	0
Typhoid Fever	11	2
Scarlet Fever	285	4
Measles	83	0
Pneumonia	33	61
Syphilis	54	0
Whooping Cough	0	2
Trachoma	3	
Poliomyelitis	1	0

NURSES' VISITS 1928

Jan	2,452
Feb	2,602
Mar	2,220
Apr	2,301
May	2,068
Jun	1,546
Jul	1,586
Aug	1,639
Sep	2,093
Oct	2,030
Nov	1,956
Dec	1,566
Total	24,059

10 LEADING DISEASES AS CAUSE OF DEATH

Heart Disease	66
Pneumonia	61
Apoplexy	37
Tuberculosis (all)	23
Nephritis	21
Cancer	20
Premature Birth	19
Gastroenteritis	19
Arteriosclerosis	11
Auto Accidents	9

DEATHS BY NATIVITY AND COLOR

Deaths, Foreign born	13
" Colored	52

BIRTHS BY NATIVITY AND COLOR

Births, Foreign born	30
" Colored	95

praisal Form, prepare his Annual Report for the City of Middletown, and his Yearly Report to the State Health Department.

Dr. Lummis feels that such a record book would be of great help to health commissioners in cities of 100,000 population or less.

Pasteurized Milk in Massachusetts—The Massachusetts Department of Public Health has recently distributed, through boards of health, physicians and others interested in public health, a statement of the requirements in that state with respect to pasteurization of milk. The state law requires that milk be heated to 140–145° F. for 30 minutes, the object of pasteurization being to destroy the disease germs which are sometimes found in milk. In the last 20 years over 600 milk-borne epidemics have been reported in this country. There is no record of milk-borne epidemic due to properly pasteurized milk.

LABORATORY

C. C. YOUNG

THE CULTIVATION OF ENDAMEBA GINGIVALIS (GROS) FROM THE HUMAN MOUTH *

CHARLES A. KOFOID, PH. D., SC. D., FELLOW A. P. H. A., AND
HERBERT G. JOHNSTONE

HOWITT'S (1925) modification of the Locke's egg slant-albumen medium of Boeck and Drbohlav (1924) has proved to be by far the best medium for the growth of amebas from the mouth of man and the monkey. It has been used with great success in routine examination and culture work. Several strains of *Endameba gingivalis* have been cultivated in this laboratory for extended periods, one strain having been maintained for 33 months. With the proper care a strain of ameba may be cultured indefinitely.

The Locke's egg-albumen (L. E. A.) medium consists of coagulated egg slants (containing a small amount of Locke's solution) used as a solid base with the addition of 6 to 10 c.c. of Locke's albumen solution.

1. *Egg slants*—The egg slants are made by cracking 8 washed, fresh eggs into a liter flask containing glass beads; the flask is shaken vigorously until the eggs are homogeneous and 100 c.c. of Locke's solution are added. This mixture is tubed through a sterile apparatus and inspissated in the autoclave for 15 minutes, at 15 lbs. pressure, with all valves closed. The entrapped air is replaced carefully with steam and the slants sterilized for 15 minutes at 15 lbs. pressure. This method produces an evenly coagulated slant without air bubbles.

2. *Locke's solution*—The formula for the Locke's solution used is:

NaCl	9 gm.
$CaCl_2$	0.2 gm.
KCl	0.42 gm.
$NaHCO_3$	0.2 gm.
Glucose	0.251 gm.
Distilled H_2O	1,000 c.c.

The Boeck-Drbohlav formula contained 2.5 gm. of glucose and only 0.4 gm. KCl.

This solution is sterilized in the autoclave at 15 lbs. pressure for 15 minutes. Prolonged sterilization should be avoided as there is a tendency for the glucose to be reduced and a white precipitate of $CaCO_3$ to be formed. If this happens, the fluid should be discarded.

Heretofore the preparation of Locke's solution has consumed much time in the laboratory. The solution was made in 4-liter amounts and, as large quantities were continuously being used, frequent weighings were necessary. The utmost care must be used in the preparation and sterilization as the amebas are very sensitive to any variation in the salt content. The method now followed consists in making separate concentrated solutions of the various ingredients and adding them to sterile distilled water whenever the medium is needed. The following is 40 times the common formula of Locke's solution:

* From the Protozoölogical Section of the California Stomatological Research Group and the Department of Zoölogy of the University of California, under the direction of Professor Charles A. Kofoid, aided by grants from the Carnegie Corporation, the American Dental Association, and the Associated Radiograph Laboratories of San Francisco, Calif.

Salt Solution

Sodium chloride	360 gm.
Calcium chloride	8 gm.
Potassium chloride	16.8 gm.
Water	2,000 c.c.

Sterilize in autoclave for 30 minutes at 15 lbs. pressure.

Sodium Bicarbonate Solution

Sodium bicarbonate	8 gm.
Water	100 c.c.

This solution must be prepared carefully to prevent absorption of carbon dioxide from the air, and it must not be heated or shaken vigorously. The solution is filtered through a fine Berkefeld candle.

Sugar Solution

Dextrose	25.1 gm.
Water	500 c.c.

The sugar solution is sterilized in the Arnold for 20 minutes daily on 3 successive days.

The salt solution is put up in 110 c.c. amounts, the bicarbonate in 5 c.c. amounts and the sugar solution in 10 c.c. amounts. The flasks of salt solution and the tubes of dextrose are capped with paper while the tubes of sodium bicarbonate are corked and covered with paraffine.

To make 2 liters of Locke's solution take a flask of salt solution (110 c.c.), a tube of sodium bicarbonate solution (5 c.c.), a tube of dextrose solution (10 c.c.), and add to 1,885 c.c. of sterile distilled water. The above solutions are made every 3 months and can be kept indefinitely. Two liters of Locke's solution can thus be prepared in about 5 minutes, which is of great advantage when needed in a short time or in cases of emergency.

3. *Locke's albumen-solution*—The white of one egg is carefully cracked into a sterile liter flask containing glass beads, shaken vigorously until frothy; then 500 c.c. of Locke's solution and 20 c.c. of N/20 HCl are added. This quantity of acid proved to be about the right amount to add to a liter of fluid in order to give a pH 7.4–7.6. The remaining 500 c.c. of Locke's solution is added and the whole mixture shaken thoroughly and filtered through a Berkefeld candle. This sterile medium is added aseptically in 6–10 c.c. amounts to the egg slants.

It is possible to make the Locke's egg-albumen medium without filtering, but it has been the experience that the filtered medium gives by far the most satisfactory results. The unfiltered medium is prepared exactly as the filtered with the exception that 2 egg whites instead of one to a liter of Locke's solution are used. The eggs must be sterilized in 90 per cent alcohol before cracking and aseptic precautions observed to avoid contamination. An uninoculated control tube should be run at the time of each transplant.

The medium is warmed to 37° C. previous to inoculation with either fresh or culture material. Subgingival exudate or pus is removed by sterile sharpened applicator sticks or sterile dental scalers, and introduced into the culture tubes. The tubes should be placed immediately in the incubator at 37° C. and at no time should they be subjected to prolonged chilling.

Cultural transplants are made by removing a small amount of the material which collects in the angle formed by the egg slant and the side of the tube with a sterile Pasteur pipette and inoculating this substance into fresh medium warmed to 37° C. Transplants are made every 48 hours.

In addition to Locke's egg-albumen medium several other mediums were tried with the hope of finding one that would (1) permit a growth period of more than 48 hours without transplanting; (2) eliminate some of the harmful types of bacteria and the flagellate *Trichomonas buccalis;* (3) produce rich cultures; and (4) be easily prepared and possess a simple formula.

Locke's-egg slant blood medium reduced the number of bacteria considerably but after the first few transplants

the amebas became scarce. It was found, however, that the cultures could be transplanted every 72 hours instead of the usual 48.

The Ringer-albumen-starch-acriflavine medium used so successfully in the culture of *Endameba dysenteriae* and *Councilmania dissimilis* in this laboratory, proved of no use in the cultivation of *E. gingivalis* of man. As acriflavine is lethal for *E. gingivalis* in dilutions stronger than 1–200,000, the weaker dilutions proved inadequate in eliminating the harmful flagellate and bacteria.

Locke's egg-albumen medium with the addition of rabbit or sheep serum (3 per cent) caused a temporary increase in the number of amebas, but after 6 or 7 transplants the organisms steadily decreased, and although they persisted never again rose to the richness of the first cultures.

The medium consisting of Loeffler's serum slants and Locke's albumen caused the amebas to disappear completely after 48 hours of growth.

Following the suggestions of Koch (1926), the triaminotriphenyl methane dyes, acid fuchsin (National Aniline and Chemical Co.) and ethyl violet (Grübler), were added to L. E. A. in various dilutions to prolong the life and rid the cultures of the harmful bacterial and flagellate forms. It was found, however, that the dilutions suggested as being bactericidal and not amebicidal destroyed the strains of human and monkey amebas in one or two transplants. The ethyl violet in dilutions of 1–50,000 and 1–100,000 proved too severe; the acid fuchsin 1–1,000 did not kill the amebas but reduced the bacteria and *Trichomonas* considerably. It was found that these latter cultures had to be transplanted every 48 hours as usual. A small amount of sterile starch was added to each culture with the hope of prolonging the period between transplants. After 48 hours' incubation some very interesting observations were made. The amebas had increased greatly in size and number while the bacteria and *Trichomonas* had decreased. By the addition of a small amount of starch to the acid fuchsin L. E. A. medium, transplants could be made every 4 days instead of 48 hours. After 4 to 6 transplants the dye was found to be too severe as most of the amebas disappeared. After the second or third transplant in the medium containing the dye, the strains were put in starch L. E. A. without acid fuchsin and the number of amebas greatly increased. It was found that this temporary growth in the presence of acid fuchsin in many cases totally eliminated the flagellates and many of the bacteria.

The most interesting result obtained was that *Endameba gingivalis* was capable of ingesting starch grains. The starch cultures of both human and monkey amebas after 24 or 48 hours' incubation contained many large, sluggish amebas with the endoplasm completely packed with starch grains in various stages of digestion. The pseudopodia were usually few in number and very large. Thirty-two amebas measured in the longest diameter gave an average of 29 μ. This is an increase in size of approximately 50 per cent. A motile ameba was seen to approach a starch grain many times its own size, and after struggling with it for about 10 minutes, it finally moved to a smaller grain which it ingested in an incredibly short time. The formation of a crown of spicule-like pseudopodia was observed on the posterior end of many amebas, to which were attached clumps of small starch grains. Cultures have been maintained for 10 days containing quantities of amebas and *Trichomonas*, both of which were very active and full of starch grains. It is a general rule that cultures of amebas containing *Trichomonas buccalis* soon become foul, and within 48 or 72 hours all of the amebas will have disappeared. With the addition of a small

amount of starch, amebas may be made to tolerate *Trichomonas buccalis* for extended periods. These long period cultures do not always bear transplanting.

With the examination of stained starch culture slides (Schaudinn and iron-hematoxylin) many interesting facts were disclosed. In addition to the abnormal size, many amebas contained within the endoplasm quantities of lightly stained starch grains in various stages of digestion. Some of the grains that had been recently ingested were of the typical angular type while others, partly digested, had been completely rounded in form. It is of interest to note that no vacuoles could be seen surrounding the grains. The pseudopodia were coarsely alveolar and in a few instances clear and non-granular. The endoplasm was distinctly alveolar or coarsely granular and occasionally contained a few cocci and bacilli. After 48 hours' growth many of the amebas became much smaller and rounded. In these forms the ectoplasm was generally lacking, and if present at all, was reduced to a uniform film of 1 or 2 μ in thickness. The liquid contained in the vacuoles was tinged a delicate blue due to the presence of the digested starch. The peculiar type of vacuolation and the heavily staining, granular endoplasm in amebas from starch mediums is in striking contrast to those from either a normal culture or direct smear. The nucleus is the part of the ameba that undergoes the most drastic change. It becomes larger, with an average size of 6 μ, and is generally spherical. The chromatin is completely disarranged and assumes many bizarre formations. Although there are forms in the early cultures that resemble the beaded-central karyosome type of nucleus most of the amebas have nucleuses of extraordinary pattern. The chromatin occurs as huge blobs, coarse granules or irregular aggregates distributed throughout the nucleus. In one ameba 3 nucleuses were found, a fact not hitherto reported. An observation of interest is the peculiar clearness, distribution and number of linin fibers in the nucleuses.

The difficulties encountered in the cultivation of the ameba from the human mouth are not numerous and it is comparatively easy to maintain a strain indefinitely. ***Endameba gingivalis*** is sensitive to any great change either in the medium or temperature, and it is therefore essential to have carefully prepared mediums and not to subject the cultures to prolonged chilling. The Locke's egg-albumen medium is usually employed in our laboratory for general routine and culture work. The starch medium is used very effectively for the production of rich cultures and the maintenance of stock strains. Starch provides a source of food and the amebas appear to thrive on it. Although many abnormal and rounded forms occur in the starch cultures the normal forms persist in great numbers. Much time is saved as these cultures are transplanted every 4 or 5 days. A judicious use of dyes in combination with either plain L. E. A., or L. E. A. plus starch, rids the cultures of many of the harmful bacteria and flagellates so commonly found in the human mouth.

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VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

National Safety Council Issues Form for Study of Fatal Accidents in the United States—The National Safety Council has prepared a form for use in state bureaus of vital statistics for the description of the more than 90,000 deaths which occur from accidents each year in the United States. At the present time, statistics for fatal accidents in the United States are presented each year only under the titles of the *International List of Causes of Death*, and these give information chiefly on the means of accident.

The new form drafted by the National Safety Council will enable state registrars to secure the following additional facts: the results of the accident, number of dependents left by the deceased, and the class or kind of accident, whether it occurred in the home, in industry, as the result of a vehicular accident, or from other public hazards.

For home accidents, the means of injury are specified, whether the accident was due to a fall, to burns and scalds, asphyxiation, poisoning, or cuts or scratches. For industrial accidents, practically the same information will be gathered for fatalities reported to the state bureaus of vital statistics as are now collected by workmen's compensation commissions.

It is proposed to show the number of industrial accidents involving machinery, vehicles, explosions, electricity, fires and hot substances, poisonous and corrosive substances, falling objects, the handling of objects and the use of hand tools, etc. For vehicular accidents it is purposed to collect facts as to whether the person killed was the pedestrian or driver, whether the accident was the result of a collision, who drove the vehicle, the age and sex of the driver, and other important information needed for accident prevention purposes. For public accidents not involving a vehicle, the statistics will attempt to show whether death resulted from a street or sidewalk accident, in buildings or structures, by drowning, through the use of firearms and through other public accidents not involving a vehicle. On the reverse side of the form a schedule of definitions is given which will guide local and state registrars in the classification of accidents.

When this system goes into full effect in each of the states, it is hoped that the resulting statistics will provide the basis for a broad-gauge accident prevention movement directed at accidents in the home, in industry and on our streets. The form was drafted by a joint committee representing the Statistics Section of the National Safety Council and the Section on Vital Statistics of the American Public Health Association.

The form should be of interest to insurance men, and copies may be obtained from the Statistical Division of the National Safety Council, 108 East Ohio Street, Chicago, Ill.

Tuberculosis in School Children—The Department of Public Health of Massachusetts began in 1924 a 10-year program for the examination of the school children of the state. This study is based on 42,071 children who were given the Von Pirquet tuberculin test during a period of 3 years. The percentage of reactors in the children studied shows a gradual upward trend. Of 902 children aged 5 years, 20.8 per cent

gave a positive test; 30.4 per cent of 5,451 children aged 12 years were positive, and 34.6 per cent of 1,920 children aged 15 years were positive. The study showed no marked variation in the number of reactions in the children of different nationalities when there was no history of contact. But approximately twice the number of children reacted to the tuberculin test when there was a history of exposure to a case of pulmonary tuberculosis. The lowest percentage of contact reactions was present among children of mothers born in England or Scotland. Of 223 exposed children, 38.5 per cent gave positive reactions. Among the non-contacts of the same nationality 22.8 per cent of 1,623 children were positive. In the Latin group, which included children of mothers born in France and Portugal, 55.9 per cent of 259 exposed children were positive, as against 27.5 per cent of 1,123 non-exposed children. The Teutonic group, including children of German and Austrian mothers, showed the highest percentage of reactions among the contacts. Of 75 contacts, 73.3 per cent were positive, as against 24.0 per cent of 533 non-contacts. In some instances there was a much higher incidence of infection among boys than among girls of the same nationality. In the Irish group, 31.8 per cent of the boys gave positive reactions as against 25.7 per cent of the girls; in the Canadian group 35.8 per cent of the boys were positive as against 23.8 per cent of the girls; and in the Teutonic group 38.2 per cent of the boys were positive as against 25.1 per cent of the girls.

Different sections of the same city may show a wide variation in the percentage of reactions. It was found in one city of 60,000 population that the number of children reacting to the tuberculin test in different school districts varied from 11 per cent to 60 per cent. Chronic forms of pulmonary tuberculosis such as are found in granite quarry workers, expose and infect more children than the more acute cases who live a much shorter time after the disease becomes infectious. Crowded living conditions afford more opportunities for contact, and congested areas show a higher percentage of infection.—Henry D. Chadwick and David Zacks, The Incidence of Tuberculous Infection in School Children, *New England J. Med.*, 200: 332–337 (Feb. 14), 1929.

Tonsils and Rheumatism—A survey was made of 439 children who had acute rheumatism. The most susceptible ages for the first attack were between 5 and 15 years. Of the 439 cases, 126 had the first attack between the ages of 5 and 10 years, and 239 had the first attack between the ages of 10 and 15. The first attack appeared in 123 of the 439 children who had their tonsils removed, as compared with 316 where the tonsils were still present. Recurrent attacks of rheumatism occurred less often in children who had their tonsils removed after the first attack than in those whose tonsils were not removed. Of the 316 children who had their first attack before the tonsils were removed, 80 had one or more recurrent attacks of acute rheumatism before enucleation of the tonsils and 56 had their second attack after enucleation of the tonsils. Thirty-one of 123 children who had acute rheumatism for the first time after tonsillectomy had recurrences, and 31 of 159 children who had the tonsils removed after the first attack had recurrences. The incidence of carditis as a complication in acute rheumatism was nearly as frequent in children who had undergone tonsillectomy as in those who had not. Forty per cent of 316 children who did not have their tonsils removed, developed rheumatic endocarditis, as compared with 39 per cent of 123 children who underwent tonsillectomy. Chorea occurred as a complication in acute rheumatism with equal frequency

in children operated and not operated on, but the association of carditis with chorea was less in children whose tonsils had been removed. Tonsils are the avenue of infection in many cases of rheumatism and bear a definite relationship to this disease. Their removal should be advocated in the rheumatic and potentially rheumatic child until more is known of the etiology of the disease.—Albert D. Kaiser, The Relation of the Tonsils to Acute Rheumatism during Childhood, *Am. J. Dis. Child.*, 37: 559–564 (Mar.), 1929.

A Setback in Mid-life Mortality—Since 1920 there have been 5 particularly good health years, and 2 that fell below the general average. For the years 1921, 1922, 1924, 1925 and 1927 the crude death rates for the United States Death Registration States were 11.6, 11.8, 11.8, 11.8 and 11.5 per 1,000 population. For the years 1923 and 1926 the crude death rates were, respectively, 12.3 and 12.2 per 1,000 population. The series of expectations of life at birth for the years 1921, 1922, 1924, 1925 and 1927 runs somewhat irregularly as follows: 58.01, 57.89, 58.11, 58.20, 59.10. The corresponding series of figures for the expectation of life at age 5 was 59.37, 58.97, 58.81, 58.54, and 58.78. At age 37 the continuously decreasing sequence is again shown with a series of 32.86, 32.26, 31.98, 31.50 and 31.47. At birth the expectation of life in 1921 was 58.01 as against 59.10 in 1927. But after the first year of life there is practical equality, namely 61.49 for 1921 and 61.48 for 1927. Thus the gain in expectation of life during the 7-year period from 1921 to 1927, inclusive, is secured chiefly by the improvement in infant mortality. From age 37 on there has been an increase in the mortality rates for 1927 as compared with 1921. At age 42 the death rate was 7.61 per 1,000 in 1921 as compared with 8.37 in 1927. At age 52 the death rate was 12.99 in 1921 as compared with 14.68 in 1927. At age 62 the death rate was 26.78 in 1921 as compared with 29.44 in 1927.

For the industrial policyholders of the Metropolitan Life Insurance Company the matter has a slightly different aspect. As they represent essentially the wage earning population, their expectation of life still falls somewhat short of that for the general population. A gain in expectation of life is recorded up to and including age 5, for 1927 as compared with 1921. As compared with 1922, the year 1927 shows a gain in expectation of life up to age 30. But the mortality conditions have been improving only at the younger ages of life. —*Stat. Bull.*, Met. Life Ins. Co., 10: 1–4 (Feb.), 1929.

Mortality in Childbirth—At the present time the mortality rate in childbirth is lowest in those countries where the delivery of normal cases is almost entirely in the hands of the trained midwife. In England with the midwives in charge of only 50 per cent of the deliveries, the mortality rate is higher than in the countries on the continent where midwives deliver 85 to 90 per cent of the cases. In the United States maternity care has been largely in charge of the medical profession. The number of physicians available for care during childbirth is rapidly diminishing, and there is need for nurses and midwives trained to care for normal patients for whom no physician is available. In the birth registration area of the United States, the maternal mortality rate of 6.5 per 1,000 live births has remained practically the same for the past 20 years. In the southern states of this country inadequate care among the colored women is largely responsible for the high death rate. The average maternal mortality rate in the cities for 1927 was 7.5 per 1,000 live births, as compared with a rate of 5.5 in rural

districts. The death rate from puerperal septicemia was 3.1 per 1,000 live births in the cities, as compared with 1.9 in rural districts. The lower death rate for rural districts may be due to less interference with labor, and a reduction of infection associated with operative deliveries. Puerperal septicemia is the cause of over 40 per cent of maternal deaths, and eclampsia the cause of more than 25 per cent. Almost 20 per cent of deaths are due to accidents of pregnancy and labor which could be greatly reduced by proper supervision.

About 40 per cent of the births in this country are in the hands of midwives, and over 90 per cent of these women are untrained. During the past 10 years the New York State Department of Health has been active in improving the practice of the midwife, and as a result the number of midwives has been greatly reduced. In 1916 midwives reported 16.13 per cent of the total births, as against 7.09 per cent in 1926. In 1911 a school for midwives was established in connection with the maternity service at Bellevue Hospital. The midwives at the school have delivered 13,762 women since 1911. One hundred and thirty-three of the cases were transferred to Bellevue for hospital care. There were 11 maternal deaths, and 4 of these occurred among the cases transferred to the hospital. The maternal death rate was 0.75 per 1,000 live births; the stillbirth rate was 1.77 per cent; and operative delivery by forceps was 2.32 per cent.

As a result of state registration of midwives and on account of restricted immigration, the need and demand for midwives will rapidly decrease except possibly among the rural colored population of the South. Prenatal care would increase the number of normal deliveries and lessen the number of operative deliveries. Furthermore, the standard of maternity care would be greatly improved if the number of properly organized maternity hospitals could be increased, and if maternity services were established in local general hospitals for the care of abnormal obstetrical cases.—Frederick W. Rice, The Problem of Reducing Mortality Associated with Childbirth, *New York State J. Med.*, 29: 262–267 (Mar. 1), 1929.

Suicides in Budapest—A comparison of figures relating to the rate of suicides in Budapest shows that the rate was lower in prewar years than it has been in postwar years. The number of suicides was 334 per 1,000,000 inhabitants in 1874; 462 in 1910–1913; 357 in 1914–1918; and 505 in 1923–1927. Prior to the war 68 per cent of the suicides were men, and 32 per cent were women. For the period 1923 to 1927, 57 per cent were men and 43 per cent were women. The numerical increase of suicides was in young women and in old people of both sexes. From the point of view of religions, the number of suicides is lowest among the Roman Catholics, next among the Jews, and highest among the Protestants. From the standpoint of occupation, suicides are most prevalent among those having an uncertain existence, among merchants, those dealing with credit business, and craftsmen's assistants. Among women, domestic servants and pensioned widows are to the fore. High suicide indexes such as exist in Budapest are found also in Berlin and Dresden.—Suicides in Budapest and in the Large European Centers, *J. A. M. A.*, 92: 699 (Mar. 23), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Drinking Fountains—The drinking fountain has not received as much attention from public health officials as its widespread use warrants. Several years ago the Minnesota Department of Health studied this subject and published its findings in *Public Health Reports* for May 11, 1917. More recently, that department has deemed it of value again to draw to the notice of the public the fact that not all types of drinking fountains are satisfactory. This was done through the adoption of the resolution given below:

WHEREAS, public drinking fountains have largely replaced the common drinking cup and are provided in a great many places accessible to the public, and

WHEREAS, investigations have shown that disease producing bacteria may be transmitted from one person to another through the use of improperly constructed or improperly operated drinking fountains, and

WHEREAS, the observations made by the State Board of Health have revealed the presence of insanitary types of drinking fountains in many public and semi-public places throughout the state, therefore be it

RESOLVED that the attention of the public be drawn to the fact that not all drinking fountains are satisfactory and that to be sanitary, drinking fountains should conform with the following general requirements:

1. The jet of water emerging from the fountain should be slanting so that discharged water does not fall back onto the surface.

2. The orifices from which the water emerges should be protected in such manner that they cannot be touched by the lips or be contaminated by droppings from the mouth or by splashings from the base beneath the orifices, and

3. An adequate supply of pure water, under sufficient pressure, properly controlled, should be provided in order to insure satisfactory operation of the fountain.

Significance of Bacteria of the Coli-Aerogenes Group in Drinking Water; Two Possible Sources—American biologists have found that organisms of the coli-aerogenes group are divisible into two subgroups by their reactions to four tests, and have suggested that the coli subgroup is derived mainly from animal intestines, while the aerogenes subgroup occurs commonly in soil and water. The distinguishing tests are: (1) the high ratio of carbon dioxide to hydrogen in the gas evolved from cultures of the aerogenes subgroup in dextrose broth (Clark). Methyl red is consequently colored red by growth of coli subgroup, yellow by aerogenes. (2) The formation of a red color when 5 c.c. of 10 per cent caustic potash is added to a 4-days Clark culture of aerogenes subgroup and incubated for a further 24 hours. Coli subgroup does not give this color (Voges-Proskauer reaction). (3) and (4) The growth of aerogenes subgroup in liquid mediums containing uric acid (Koser) and sodium citrate (Koser-Simmons) respectively. In both cases the coli subgroup is inhibited. The authors carried out comparative tests on 510 cultures isolated from natural waters, and 490 cultures obtained directly from human and animal excrement. The standard German method for testing gas production (Eijkmann-Bulir at 46° C.) was followed. The water cultures gave 95 per cent gas formers, the fecal 94.5 per cent. Applying the American tests, the proportions were 96.2 per cent and 95.9 per cent. By both methods the presence of *B. aerogenes* was shown in 1.4 per cent of the water cultures, and in 0.4 per cent

of the others. The American distinguishing tests for coli and aerogenes are superfluous when the Bulir gas forming test is carried out at 46° C. and this gives strong evidence of intestinal origin of a strain of coli.—Minkewitsch, Trofimuk, Wedenjapin at the Acad. Mil. Med. Leningrad, *Ztschr. f. Hyg. u. Infectionskrankh.*, 109: 348, 1928. (From papers of Water Pollution Research Board, England.)

Biological Purification of Town Sewage in Sewage Fish Ponds—A description is given of the sewage fish ponds of the "Mittlere Isar A.—G" in Munich which are almost completed. Their function is to purify biologically the sewage from Munich, which has already been mechanically clarified. The ponds cover 233 hectares, and consist of 30 large ponds for breeding carp, and other smaller ponds for hatching. The total production, exclusive of tench, which also breed, is about 100,000 kg. of carp, and the gross yield per hectare of tank-surface is estimated at 1,000 R. M.—A. Schillinger, Paper read before Meeting of Verein deutscher Chemiker, *Chem. Ztg.*, 52: 481, 1928. (From papers of Water Pollution Research Board, England.)

Size of Pores and the Mechanism of the Berkefeld Filter—A description is given of some experiments to discover whether the mechanism of the Berkefeld filter depends solely on straining or is partly due to the adsorption force exerted on the bacteria by the diatomaceous earth. The method was to determine the maximum and average size of the pores and compare the result with the size of bacteria. The existence of some adsorption mechanism would be proved if the pores were the larger. The size of the largest pores was ascertained by measuring the pressure necessary to drive air bubbles through a cylinder filled with water, and calculating the value from Einstein's formula. The average size of the pores was found by noting the quantity of water passing through the cylinder in unit time at unit pressure, and calculating the value from Bechhold's formula. The majority of Berkefeld filters in use were found to have an average pore size of about 2 μ, which would only retain bacteria to the size of 1 μ, showing that their efficacy is due to an adsorption mechanism. Owing to this, it is possible to choose comparatively big pores for these filters, without making them permeable to germs, and thus give them a high productivity.—H. Hock, *Chem. Fabrik.*, 645, 1928. (From papers of Water Pollution Research Board, England.)

Causes and Prevention of Hydrogen Sulphide in Abattoir Sewage—Details are given of an investigation at Sydney arising from hydrogen sulphide formation, with consequent corrosion, in concrete sewers carrying abattoir effluents. The installation of a plant to recover part of the suspended solids failed to eliminate the trouble. The time of decomposition, as measured by the discoloration of lead acetate paper, of mixtures of ½ per cent of blood in salt solution with varying quantities of dissolved and suspended proteins, was found to be 4 to 10 days, as against 1½ hours in the sewers. It was suggested that putrefying paunch contents, delayed in passing from the by-products works to the sewers, inoculated the fresh material—a view supported by the fact that at laboratory temperatures the time of decomposition was in one instance 24 hours, against 1 hour at 37° C. Cultures from paunch were made on agar containing ferrous sulphate, and dark-stained colonies indicated the presence of an organism producing hydrogen sulphide, subsequently identified as *B. coli communis*, which was found to be associated with the coarser solids in paunch. Abattoir discharges during the night were of such

a temperature as to provide optimum conditions for bacterial growth; a cooling system was therefore introduced, and hydrogen sulphide fixed by treatment with iron, with sufficient lime to inhibit multiplication of organisms. The authors conclude that the desiderata for gas elimination are: maximum removal of solids; avoidance of delay in discharge to sewers; cooling of effluents, and sterilization of plant when shut down.—A. B. Porter and J. A. Cresswick, *J. Soc. Chem. Ind.*, 47: 380T, 1928. (From papers of Water Pollution Research Board, England.)

General **Review of the Studies of Plankton of Large Rivers**—In this article are collected the results obtained by numerous workers from studies of plankton in rivers in France, Great Britain, Germany, Austro-Hungary, Italy, Spain, Switzerland, Sweden, Russia, Asia, Africa and America. The author correlates this information in the second part of the article which deals with the characteristics of plankton in rapid flowing rivers. A comparison is also given of the phytoplankton of the Loire and of rapid flowing rivers.—J. des Cilleuls, *Internat. Rev. d. ges. Hydrobiol. u. Hydrograph.*, 20: 174, 1928. (From papers of Water Pollution Research Board, England.)

Interesting **Features of Audubon Park Natatorium, New Orleans, La.**—Twin pools from 3′ to 9′ in depth, a separate pool 40′ x 80′ for children, an ornamental concourse around the pools, a dry moat and fence outside the concourse, pressure filters, chlorine dosing apparatus, pumps, lighting system, two bath houses each 30′ x 214′, roadways and parking place for 600 cars, comprise this natatorium which was constructed at a cost of $250,000, of which $90,000 was the cost of the pools.

Automatic safety valves permit ground water to enter the pools when they are nearly empty, thus relieving the pressure on the underside of the floor. Twin pools permit the cleaning of one pool while the other is in service. The usual dangerous pipe ladder is replaced by notches forming steps in the concrete wall, and a hand rail which does not reach to the water. The filter capacity is 100,000 gallons an hour. Alum is used as a flocculent. Bath houses are provided with lockers, dressing rooms, private showers, and a passage 35′ long provided with a barrage of showers and 6 inches of flowing water for cleansing the feet for a pool entrance. Careful inspection of bathers and water inspections are made.—William Scheppegrell, *Am. City*, 39, 4: 129–130 (Oct.), 1928. Abstr. S. H. Smith.

Pollution of Tidal and Non-tidal Waters—The author gives a general review of the causes and effects of pollution in tidal and non-tidal waters. The general effect of all pollution is to degrade or to destroy normal life in the affected stream. It may supplant or supplement normal flora and fauna by other organisms and may render the stream incapable of supporting fish life. In this connection reference is made to the work of Butcher and Pentelow on the River Lark.

With regard to the effects of pollution on the dissolved oxygen content of streams, the author quotes Adeney's work on the aeration of water and gives limiting rates for the absorption of air by water at different temperatures. In non-tidal streams the effects of pollution only manifest themselves below the point of discharge, but in tidal waters the reversal of flow produced by the tide causes pollution to travel both above and below the point of entry and retards the escape of effluents from the river. On the other hand, it tends to stir up matter which otherwise would accumulate on the bottom and ferment,

giving rise to a nuisance. The main effect of pollution on fish life is the reduction of the dissolved oxygen in the water.

A study of the oxygen requirements of fish has shown that the dissolved oxygen in the water of salmon and trout streams should not be allowed to fall below 70 per cent saturation or below 50 per cent for other fish. The author concludes with a discussion of the law with regard to river pollution and gives his views as to the duties which should be carried out by river authorities responsible for the diminution of pollution.—J. H. Coste, *Tr. Soc. Chem. Ind.*, 47: 133, 1928. (From papers of Water Pollution Research Board, England.)

Production of Milk of Low Bacterial Content by Means of Milking Machines—An Alfa-Laval milking machine, typical of most modern machines, was used with two milking units. One unit was washed, brushed, and rinsed in water at 185° F. after each milking; in the other all rubber parts were washed, brushed and sterilized by steam for 10 minutes at 210° F. after each milking. Disinfectants were not considered because "as used in practice they are not to be compared in efficiency with less expensive sterilization by steam."

Plate counts showed enormous fluctuations with both units. After other possibilities were eliminated, the contamination was found, by means of a suspension of carmine, to be due to small quantities of water in the vacuum pipe line finding their way into the receiving pails. By turning all vacuum supply taps upward, giving a generous slope to each section of the vacuum pipe line, and providing drain cocks at each low point, leakage was eliminated, and excellent results followed. Of 191 samples of 28-hour old milk examined for each unit over a period of 1 year, the sterile unit showed 173 below 10,000 per c.c. and 190 below 200,000 per c.c.; while for the washed unit 151 were below 10,000 per c.c., 167 were below 200,000 per c.c., and 20 were over 500,000 per c.c. The average keeping quality of milk at 60° F. was 96 hours for the sterile unit and 86 hours for the washed unit. In machines from which test cup liners are readily removed, steam sterilization is successful, without seriously shortening the life of rubber parts.—A. T. R. Mattick and F. Procter, *J. Hyg.*, 27, 2: 215–224 (Jan.), 1928. Abstr. A. W. Fuchs.

Bacterial Examination of Water in Public Swimming Baths—The author reviews the literature of transmission of disease by swimming baths and of bacterial standards. Practically all of the standards considered are of United States origin.

Experimental results obtained from a number of places in England during 1925–26 are given. These data include bacterial results, methods of operating the bathing pools, number of persons using baths and effects of temperature.

The author concludes in part that: (1) Pollution is less in cold weather than in warm, regardless of methods: (2) continuous filtration is superior to occasional emptying and filling with fresh water; (3) standard adopted should be as stringent as that for drinking water (U. S. Treasury), and (4) it is not possible to maintain this standard without continuous disinfection with some agent such as chlorine.—G. K. Bowes, *J. State Med.*, 36, 9: 521–545 (Sept.), 1928. Abstr. C. T. Butterfield.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Relation of Illumination to Ocular Efficiency and Ocular Fatigue—The office of Industrial Hygiene of the U. S. Public Health Service announces the publication shortly of *Public Health Bulletin No. 181,* which is devoted to a study of the relationship of illumination to ocular efficiency and fatigue.

This study was made during the period 1924 to 1926, in the main post office of Chicago. The purposes of the study were to determine the degree of illumination under which the distribution of mail might be made with the greatest ease and efficiency; to demonstrate ocular fatigue and determine its relation to different degrees of illumination.

In order to rule out the effects of the mental attitude of the worker and the effects of variations in the amount of work on hand, the sorting of small letter mail by the night shift received much attention. In this case, it was found that there resulted an increase of approximately 8 per cent in sorting speed when the illumination was increased from 2.7 to 10.7 foot candles.

In a series of tests, where 1,000 specially prepared cards were used as the test mail, it was found that the time to read the addresses on the cards decreased 8 per cent when the intensity of illumination was increased from 2.5 to 10 foot candles.

The studies of the effect of the degree of illumination upon ocular fatigue showed that visual acuity improved after the subjects had worked under high illumination for a sufficient length of time, and decreased correspondingly after working under low intensities of illumination. This is, unquestionably, a very important significant finding.

Studies on refractive errors indicate the incidence of these defects to be rather high. Fifty per cent of the clerks wore glasses.—*Pub. Health Rep.,* 44, 8 (Feb. 22), 1929. L. G.

French Experience Regarding Occupational Diseases Caused by X-rays and Radio-Active Substances—The first signs of exposure to these radiations consist in blood changes, wherein: first, the numbers of white blood corpuscles and then the red blood corpuscles are altered. The first of the white blood changes consists in a reduction of the leucocytes. Later, this is followed by a decrease in the number of red blood corpuscles, at which time these are characterized by inequality of size and shape. There is also a lowering of arterial pressure, but, nevertheless, no disturbance of the cardiovascular equilibrium. There may be changes in the reproductive organs, producing sterility and disordered menstruation. Finally, there may be disturbances of nutrition, characterized by loss of weight and other subjective symptoms. Locally, there may be traumatic effects resulting in radio-dermatitis, burns and lesions of the skin and underlying tissues.

The protective measures, recommended by the French Academy of Medicine, consist in adequate ventilation of work places, the use of rubber gloves and of forceps for handling of the materials, protection from the rays by plates of metallic lead and periodic medical and blood examination of the workers. The radioactive substances considered as injurious include the following: radium, radium emanation, radioactivity induced by radium or radon,

polonium, actinium, thorium, mesothorium, and radiothorium, thorium X, emanation of thorium, or thoron, and radioactivity induced by uranium, and its salts, uranium X, and ionium.

The following types of industrial processes were considered potential sources of poisoning from these substances: Plants for the extraction of radioactive elements from minerals, manufacture of derivative radioactive substances; plants making medical appliances for radium therapy, or X-ray appliances; laboratories for research or measurement of radioactive substances and X-rays; plants making radioactive chemical or pharmaceutical products, and factories making radioactive luminous products or workshops in which these paints are applied; clinics and sanatoriums, centers for the treatment of cancer; enterprises for the sale of radium and radioactive substances; and manufacturing establishments using X-rays.—Abstr., *Month. Labor Rev.*, 28, 1: 77 (Jan.), 1929. L. G.

Road Tar Poisoning—This contribution presents the report of the case of a workman, aged 30, employed as a tar wagon tender, engaged in highway construction.

In the usual fashion, the tar was melted in a roadside oven, but was allowed to flow from the tank by some passing school children. The worker in question waded through a considerable body of tar and finally succeeded in closing the spigot.

Later, during the same day, the worker was carried to a hospital, shortly after becoming violently ill and experiencing convulsive seizures. It was found that marked pulmonary edema was present, as were also superficial burns of the mouth and upper respiratory tract. After one week in the hospital he was discharged, but shortly after developed a severe hemorrhage from the respiratory tract. From this time on, he presented a condition of multiple hemorrhage, nephritis, anemia and general emaciation, followed later by neurasthenic and hysterical symptoms.

The symptomatology associated with the nervous system continually increased and, finally, resulted in an abnormal mental state, as well as paralysis of the right leg.

Coal tar is the residue after coal tar distillation is complete. It consists of a number of complex organic materials among which are phenols and naphthalene.—*J. A. M. A.*, 92, 9: 695 (Mar. 2), 1929. L. G.

Compensation for Silicosis—The British Home Office has now abruptly abandoned its plan of extending compensation for silica to one industry at a time and has instead issued a comprehensive draft scheme for granting compensation for death and total disability in practically every occupation in which a silica risk is present.

It is important to note that under this new plan workers in the initial stages of the disease are not entitled to compensation. Compensation should be awarded only for total disability or death, but it is the plan to study each industry for the purpose of linking up preventive procedure with compensation award.

To the abstractor, this appears to be a most rational and commendable step in the study and mitigation of occupational diseases. It would be well if we, in the United States, would follow such procedures.—*Month. Labor Rev.*, 28, 1 (Jan.), 1929. L. G.

Pneumonokoniosis from Sand Blasting—This paper presents a detailed examination of 26 men employed in the process of sand blasting. In 16 cases pronounced X-ray findings were found. In 2 of these tuberculosis and pneumonokoniosis were found, in 2 tuberculosis without pneumonokoniosis, and in 10 silicosis was found, 7 of which

presented changes of very marked extent.

The duration of exposure in all cases was relatively short: in 1, 8 years; in 1, 6 years; in 2, 4 years; in 1, 3 years; and in the remainder less than 3 years. Of the workers the older ones presented more marked evidence of injury.

Physical signs were comparatively slight in spite of the fact that in many cases the X-rays showed advanced disease. Chest expansion was apparently a good index, being poor in most cases.

Four of the 26 workers died shortly, and 4 others who were examined at a later period showed marked extension of the pathological process.—E. V. Müller, *Zentralb. f. Gewerbhyg.*, 5: 148 (May), 1928; Abst., *J. Indust. Hyg.*, Feb., 1929, p. 36. L. G.

The Etiology of Silicosis—There are five milestones to our present attitude toward this disease: (1) Agricola in the 16th century pointed out that there were two kinds of injurious dust, one non-corrosive and the other corrosive; (2) Alison, in the early part of the 19th century, established the association between dust-phthisis and tuberculosis (or tubercles); (3) Zenker, in 1867, showed that lung pigmentation was directly due to inhaled particles; (4) Collis, in 1915, insisted upon the importance of free silica, SiO_2, and that in industry no other dust was of importance in dust-phthisis; and (5) McCrae, just before Collis's lecture, announced that the particles of free silica found in the lungs were under 9 microns in diameter as a rule; and about the same time Watkins-Pitchford noted the same.

Two types of silicosis are now recognized, one uncomplicated, and the other complicated, by an infective process of which the most common is tuberculosis. The tissue cells concerned in both processes belong to the same cell system, i.e., the "lymphatic cell" of Calmette. Gye and Kettle, and the writer, have advanced the view that the behavior of silica dust is related to its slow solubility in the tissues, citing 7 facts to support this. The minute size of the particles, the resulting phagocytosis, the concentration of dust, duration and conditions of exposure are the factors determining dust-phthisis while pigmentation is not characteristic of free silica, but is due to carbon inhaled as smoke or dust.

So-called "miners' phthisis" means superimposed infection on the fibrosis already set up and favors acute pneumococcal or streptococcal infections as well as tuberculosis. Guinea pig experiments show that silica dust remains in the lungs up to the time of death, but coal dust will have practically disappeared in an equal time. (Discussion of the forms of clinical silicosis follows under the headings of silicosis, tuberculo-silicosis, and silico-tuberculosis.)

Experiments show that it is difficult to infect animals with dry tubercle bacilli, even when associated with dust, but it is easy to produce inhalation infection with microörganisms suspended in droplets of water. "Two hours' summer sun may kill a culture of *B. tuberculosis*. The bacilli may, however, survive up to 10 days in dry dust exposed to a poor light. They may remain virulent for months in wet mud or garden soil." Hence, conditions in mines favor the viability of the tubercle bacillus, as it has been noted that water particles may occur in the proportion of 150 to every dust particle.

Furthermore, Calmette points out that water particles from 2 to 15 microns in diameter are respirable and may remain in suspension in the air up to 7 hours. Therefore droplet infection is possible and the ideal conditions for the same obtain at least in the Witwatersrand mines.

Light and dryness are the enemies of the tubercle bacillus—conditions which do not exist in these mines. Silico-tuberculosis is only met with in those

dusty trades that use water for dust laying. Coal miners (colliers) work in dry surroundings and therefore have no silico-tuberculosis. While the inhalation route may be the common path of tuberculous infection in dusty trades, the use of water for dust prevention is not an unmixed blessing, for while it hinders the dust factor it facilitates the tuberculosis factor. Furthermore, droplets facilitate the entry of dust particles. This may explain the comparatively disappointing results by the use of water in mines to reduce air-borne dust. It is, however, at present the only available method for dust laying in many trades and its use has been followed by a decrease in pneumonokoniosis.

The use of ventilation in coal mines has eradicated pneumonokoniosis, not the use of water. Hence, a phthisis-producing industry depends not only upon the inhalation of dust but upon conditions which favor inhalation infections and super-infections with the tubercle bacillus.

"Tuberculosis is an environmental disease rather than an infectious disease in the ordinary sense." Conditions in some industries favor "case to case infection and super-infection and the inhalation route is suggested as a common route (dust-phthisis is proverbially non-infectious in the home)." Infection may be unimportant in ordinary tuberculosis, but it does not follow that it is an unimportant factor in silico-tuberculosis. "Dr. Louis Irvine, Chairman of the Miners' Phthisis Medical Bureau, has been watching our silicosis for 25 years, and he tells me that the variety he now sees is becoming more and more like ordinary chronic fibroid phthisis. Professor E.-L. Collis gives me similar information based on his experience with the disease in Great Britain." It is probable that certain metallic dusts may modify the disease, judging from the studies of hemochromatosis, and while silicosis is predominantly nodular in distribution, it is likely that the drier the working conditions, and the less soot present, the greater the part played by the interstitial process.

Experts will, at the first glance, recognize the disease, at the second, the industry, and at the third, the district. Engineers are always asking how much dust it takes to produce miners' phthisis and how much is inhaled in a unit of time; but it is difficult to explain that individuals vary in their ability to deal with dust, so that the dust sampling apparatus will not tell how much dust is retained nor its endangering effects. As Haldane points out, "Man is not a machine" (nineteen pages of discussion follow).—J. Mavrogordato, *Rapports*, IV[e] Reunion de la Commission Internationale Permanente pour l'Etude des Maladies Professionnelles, Lyon, 3–6: 1–23 (Avril), 1929, Société Anonyme de l'Imprimerie A. Rey, 4 Rue Gentil, 4.

Report of South African Institute for Medical Research—This report discloses some interesting experimental work conducted with asbestos dust. Apparently the pathological changes produced in animals were similar to those produced in workers, the time element, however, being longer. Amorphous silica dust apparently produced a fibrosis out of proportion to the quantity of dust present, suggesting that this is perhaps more readily soluble than certain other forms of silica.

Routine studies on tuberculin reactions of individual mine workers have been conducted. So far, however, only one death from tuberculosis has occurred among those who gave a positive tuberculin reaction.—*Annual Report of the South African Institute for Medical Research for the year ended 31st December, 1927*, Dept. Indust. Hyg., pp. 28–31, Johannesburg, 1928. Abstr. *J. Indust. Hyg.*, Feb., 1929, p. 40. L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

The Nutritive Value of Milk. I. The Production of Nutritional Anemia in Albino Rats through Exclusive Whole Milk Diets—As a step in the study of food value of milk, rats were fed exclusively whole milk diets. Milk from three groups of Holstein cows on very different rations was fed to three groups of rats. With two exceptions all rats grew well for 3 weeks; growth then slowed, and stopped after 6 weeks. Rats then maintained their weight for several weeks, after which there was decline and death. Anemia was present and was confirmed by post-mortem examination. Another group of rats was fed mixed milk from an entire herd of Holsteins and Jerseys, with the same results. Hemoglobin determinations on rats on an exclusive milk diet for 11 weeks showed between 2 and 3 gm. of hemoglobin per 100 c.c. compared with 15 to 16.5 gm. per 100 c.c. for normal rats. In attempting to eliminate the dietary anemia by supplementary feeding, a number of procedures were studied, to be presented in a subsequent paper. The only success in correcting the anemia was by the use of specially prepared yeast, hog liver, or solutions of iron and copper fed simultaneously. The procedure is described for determining the preventive or curative power of the test substances by means of hemoglobin determinations on the blood of the test animals.—W. E. Krauss, *J. Dairy Sci.*, 12: 74 (Jan.), 1929.

Nutritional Value of Copper in Powdered Whole Milk—Young rats, 25 to 27 days old, were fed whole milk powder supplemented with cod liver oil. Weight and hemoglobin determinations were made weekly. Growth curves and hemoglobin determinations are shown for animals receiving whole milk and those receiving whole milk plus iron. Those on the whole milk diet failed to grow and were anemic, while those on the iron supplement showed good growth and hemoglobin production for a period of 10 weeks. The powdered milk contained about 0.0006 per cent copper due to the solvent action of the milk on the copper evaporating pan. It is contended that the presence of minimal amounts of copper may be beneficial instead of detrimental in spite of what has been written on the deleterious effect of copper in milk and the steps taken by manufacturers to eliminate traces of this metal. Work of other investigators is cited to show the favorable effect of small amounts of copper in nutrition.—R. W. Titus and J. S. Hughes, *J. Dairy Sci.*, 12: 90 (Jan.), 1929.

Relative Food Values of Brown (from "Entire" Wheat Grain) and White (from Endosperm of Grain) Wheaten Flour, and Their Comparative Potency for the Prevention of Xerophthalmia in Guinea Pigs—A slight superiority of whole wheat flour over patent flour in its content of vitamin A has been shown in a series of feeding experiments conducted on guinea pigs. In the general discussion of the relative value of brown (whole wheat) and white (patent) flour, it is emphasized that both flours are deficient in a number of essential nutritive factors, but that these deficiencies are not significant when the diet is liberal and varied. The difference in content of vitamin A is thought to be of signifi-

cance only when the diet is extremely restricted, as when it consists largely of bread supplemented by margarine, jam, and perhaps fruits. Under these conditions whole wheat flour should be recommended in place of white flour.—(E. J. Sheehy, *Roy. Irish Acad. Proc.*, 37 (1927), Sec. B, No. 27, pp. 415–425)—Abstract, *Exper. Sta. Rec.*, 60: 394 (Mar.), 1929.

Association of Vitamin A with Greenness in Plant Tissue. II. The Vitamin A Content of Asparagus—Previous experiments (Abstract, *A. J. P. H.*, Nov., 1927) on the vitamin A content of head and leaf lettuce suggested the possible variation in this vitamin in green and bleached asparagus tips. Bleached tips were secured by covering rows with soil and cutting the stalks before emergence from the surface. Fresh, cooked, and canned asparagus, both green and bleached, were fed to albino rats which had been depleted in vitamin A by preliminary diet, and growth determinations were ascertained over a period of 8 weeks. Chemical analyses of the asparagus, and growth curves on the various diets, are given.

Fresh asparagus in daily amounts of 0.1 gm. was fed throughout one experiment, and the fresh bleached asparagus was fed in the same amount except in one experiment where it was increased to 0.5 gm. The result was an average gain of 20 gm. and no deaths on the fresh green asparagus, while on the bleached, health and weight declined and all animals were dead at the end of the 5th week, whether on 0.5 gm. or 0.1 gm. The daily ration of cooked asparagus was 0.1 gm., both for the green and white products. Animals fared better on the cooked product and there was not such a difference between the green and the bleached, but animals on the latter fared better than on the fresh bleached. Canned asparagus, blanched 3 minutes, packed in cans, sealed and processed for 25 minutes (at 10 lb. pressure), was fed in 0.1 gm. daily doses for the green, and 0.2 gm. daily for the bleached. Animals on canned green asparagus recovered and made good growth, but those on the canned bleached asparagus declined and died at a rapid rate after the 2d week.

The authors point to the possible correlation between the depth of chlorophyl and the vitamin A content, although there is no evidence that the two are identical. It is also concluded that the inadequacy of bleached asparagus as food may not be due alone to vitamin A deficiency, but to deleterious chemical compounds, since cooking in an open kettle improved its nutritive value to some extent. Chemical analyses showed that the green tissue was lower in water and iron than the bleached, but higher in ash, nitrogen, sulfur, calcium, and phosphorus.—John W. Crist and Marie Dye, *J. Biol. Chem.*, 81: 525 (Mar.), 1929.

Vitamin A, B, and C Content of Artificially versus Naturally Ripened Tomatoes—The increased commercial use of ethylene in the ripening of fruits and vegetables prompted this investigation to determine the effect on the vitamin content of tomatoes. Tomatoes grown under inspection were picked when the "green mature" stage was reached. These were divided into 3 lots, one fed as picked green from the vines, the second ripened at room temperature, the third treated with an ethylene-air mixture. A fourth lot consisted of tomatoes ripened on the vines. The ethylene-air mixture, approximately 1: 800, was passed over the tomatoes in a bell jar provided with inlet and outlet tubes.

Rats, 40 to 50 gm. weight, were used for testing vitamins A and B, and guinea pigs, 6 to 8 weeks old, for vitamin C. In testing for vitamin B (the complex) the basal diet, casein, starch, butterfat, lard, salt mixture, was supplemented

with cod liver oil. Four gm. daily, for a period of 8 weeks, of green tomatoes, air ripened tomatoes, ethylene-air ripened, and vine ripened tomatoes were fed respectively to four groups of rats, the average daily consumption being practically the same for all groups. Growth curves show no great differences for any of these groups and the uniform gain in weight seems to warrant the conclusion that the amount of vitamin B complex did not differ in green tomatoes and those ripened artificially or naturally. The basal diet used for determining vitamin A content was irradiated to insure a supply of vitamin D.

At the end of the vitamin A depletion period, animals, at an average weight of 122 gm., were divided into 4 groups and fed as in the test for vitamin B, the amount being 2 gm. of tomatoes per animal per day. Positive controls were given 10 drops of cod liver oil daily. Here the growth curves indicate no material difference between the groups, although rats on the green tomatoes gained materially less weight than the others. The data here indicate the same amount of vitamin A in ripened tomatoes, whether by natural or artificial means, and an amount somewhat less in green tomatoes. Guinea pigs, after a preliminary diet to insure adequacy of vitamin C, were divided into negative and positive controls, the latter being given 3 c.c. of canned tomato juice daily. Four groups were fed daily 4 gm. of the 4 lots of tomatoes. Animals were weighed twice a week and autopsies performed at the end of the experiment. Positive controls showed no scurvy and negative controls severe scurvy. Guinea pigs on green tomatoes showed definite symptoms of scurvy; incipient scurvy appeared in some of the animals on the ripened, and air ripened, tomatoes but there was no difference between the two groups, both being superior in health to the group on green tomatoes. Guinea pigs on the vine ripened tomatoes were in the healthiest and best condition with no indication of scurvy. The authors conclude that tomatoes ripened by ethylene are equivalent to tomatoes ripened in the air so far as the vitamins A, B, and C are concerned.—Margaret C. House, P. Mabel Nelson, and E. S. Haber, *J. Biol. Chem.*, 81: 495 (Mar.), 1929.

Antirachitic Factor in Burbot Liver Oil—The burbot fish, sometimes called "lawyer fish" or "eel pout," is the nearest fresh-water relative of the cod, but is used for fertilizer and seldom for human food. The average fish weighs 3 lb. while the liver is alleged to be 6 times as large as that of any other fish of inland waters. One liver used in the experiment weighed 0.55 lb. The percentage of oil secured varied from 36 to 56. Because of the announcement by previous investigators that the liver of this fish probably contained antirachitic vitamins, this study was undertaken. Fresh livers were cooked under pressure and the oil which rose to the surface was skimmed and used in this experiment. Rats on a ricketogenic diet for 21 to 23 days were given for 10 additional days the diet supplemented with the burbot liver oil or cod liver oil, after which they were chloroformed and the antirachitic action measured by the "line test" technic. Varying percentages of the supplementary oil were added, from 2 to as low as 0.007. A table of results shows that 2 per cent cod liver oil ration was required for complete healing as against 0.125 per cent burbot liver oil. The 0.5 per cent cod liver oil and 0.06 burbot liver oil gave comparable results. With 0.03 per cent cod liver oil there was no healing in 3 cases and slight in 2 cases, but the same percentage of burbot liver oil showed good signs of healing. Two rats on the 0.007 per cent burbot liver oil were comparable to those on 0.06 per cent cod liver oil. Results indicate a potency in burbot liver oil about 8 times

that of cod liver oil, although there is doubt if this is due to inherent properties of the oil or variations in the individual samples, in view of recent work in which the potency of cod liver is shown to be in inverse ratio to its oil content. (*Proc. Soc. Exper. Biol. & Med.*, 25, 653 (May), 1928).—Bertha Clow and Abby Marlatt, *Indust. & Eng. Chem.*, 21: 281 (Mar.), 1929.

Effects of Massive Doses of Irradiated Ergosterol—Several investigators have shown the effect of small doses of irradiated ergosterol, but the study of large doses of vitamin D has been impossible because of impurity until the development of the irradiated ergosterol. Rats averaging 50 to 70 gm. were fed the low phosphorus rickets-genic diet for 4 weeks and rickets was confirmed by autopsy. The animals were put in 3 groups, one exposed to reflected daylight, the second given in addition 2 per cent cod liver oil, and the third, a solution of irradiated ergosterol in oil, containing from 20,000 to 100,000 times the necessary curative dose daily. The experiments lasted for 1 month, with weighings at weekly intervals. At the end of the experiment all animals were autopsied and blood analyses made. The animals fed irradiated ergosterol lost weight, suffered anorexia and general physical impairment. Growth was less than in either of the other groups, and the blood calcium concentration was 50 per cent higher than the controls. Bones of all animals appeared healed. The results indicate the possibility of harm by the use of excessive doses of irradiated ergosterol in rachitic animals. —Irwin J. Klein, *J. A. M. A.*, 92: 621 (Feb. 23), 1929.

Possibility of Infection from Bacillus Botulinus—This editorial recites the present known facts on *B. botulinus* and the possibility of its causing infection. Botulism is caused by toxins produced by types of *B. botulinus* developed in understerilized preserved foods. Because of the resistance of the spores the problem of adequate sterilization is important. The question as to the possibility of the germination of spores in the animal body has been investigated by Coleman and Meyer (*J. Infect. Dis.*, 31: 644 (Dec.), 1922), who found evidence of such germination in the closed jugular vein in laboratory animals. Recently with the use of formaldehyde to debilitate tissues, 25 spores inoculated intramuscularly grew and produced poison. Geiger showed that botulinus toxin was absorbed from fresh wounds with symptoms and death from botulism. In spite of the experimental evidence, no reports are available of human botulism from spore-contaminated wounds. It is suggested that public health officials should insist that spoiled food be destroyed and not consumed even after boiling. Such advice seems to be supported by the known wide distribution of *B. botulinus* as a soil organism.—Editorial, *J. A. M. A.*, 92: 563 (Feb. 16), 1929.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

The Baffling Problem of Maternal Mortality—One of the most baffling and distressing problems with which he has to deal, according to Mr. Chamberlain, the English Minister of Health, is maternal mortality. Speaking recently in connection with a mother saving campaign, he pointed out some of the efforts which are being made to promote maternal and child health in England and the lack of success in certain directions.

England spends annually out of public money about 10 million dollars on maternity and child welfare services. Voluntary agencies, in addition, spend large sums. Yet the maternal mortality shows no significant change. The total infant mortality has dropped during the last 22 years from 132 per 1,000 live births to 65. Mr. Chamberlain, with a restraint worthy of emulation by some public health workers on this side of the ocean, does not claim that this drop has been due entirely to child welfare activities, though he does think that the latter played a considerable part.

The maternal mortality, on the other hand, has remained almost stationary for the last 20 years or more, any tendency to change being in the upward direction. It appears extraordinary to the Minister of Health—as indeed it does to all thoughtful observers—that this condition should persist despite all the advances made in recent years in medical science and all the effort and money expended on antenatal and postnatal clinics, the training of midwives, and on propaganda generally. One of the obvious reasons for the maternal mortality is puerperal septicemia which as yet is often not preventable.

An interesting and hopeful statement made by the minister was to the effect that he had initiated an inquiry into the circumstances of every current maternal death, a study which would be carried on by a committee of experts. The interest of local authorities and the medical profession has been enlisted in the gathering of data.—London Letter, *J. A. M. A.*, 92, 13: 1136.

The Washington (D. C.) Child Research Center—In these days of belief in early health education it is interesting to hear of such a venture as this. The purpose of the Research Center, as stated, is "the experimental investigation of normal and problem children, with emphasis upon the development of the preschool child." Classification of the work is quoted in full:

1. Study of the training of preschool children
2. Study and treatment of problem children under 10 years of age
3. Parent education by means of individual conferences, lectures, group conferences, study classes and directed reading
4. Directed observation and study of preschool children by students in home economics
5. University classes in child development for undergraduate and graduate students
6. Coöperation with institutions caring for children in outlining their programs

A few of the problems studied so far —the center began work February, 1928 —are the incidence of colds in preschool children and effect of exhibition of hexyl-resorcinol upon their prevention; effect of muscle training upon flat feet and posture; influence of activity (play) and personality upon the duration and character of afternoon sleep, etc.

A parent education program is being

developed, which certainly seems a step in the right direction. Few "problem" children are unaccompanied by "problem" parents and this appears to be largely due to our inadequate educational methods.

Technical articles, popular pamphlets and a book, *The Process of Human Behavior*, are some of the publications of the center to date and will doubtless have much of value for all interested in the "neglected age."—Mandel Sherman, M.D., Ph.D., *Child Health Bull.*, Jan., 1929.

Mental Hygiene in the Public Schools—How mental hygiene may be made available and practical in our school systems is a question of great interest. Ira S. Wile, M.D., says:

Mental hygiene is a term that is frequently misunderstood as referring primarily to the problems of mental defectives. Wherever there is mentality, there is necessity for mental hygiene; wherever there are schools, mental hygiene exists; but there is considerable difference between mental hygiene that is helpful, constructive and effective and that which is poor, inadequate and disadvantageous.

Mental hygiene is merely the science and the art of preserving mental health and of preventing mental inadequacy from any and every cause, so far as may be possible.

It is patent that public schools cannot escape the implications of responsibility contained in this form of definition. Who goes to school? The child. He goes with his body, his mind and his soul. The entire child is at school.

Whether desired and purposed or not, every element that is placed into a school system has a positive, neutral or negative value for mental hygienists.

The school systems must recognize that all children are not cast in the same mold. The school has been wont to dwell upon intellectual deficiencies without adequate recognition of emotional disturbances. The average school program of today, in the light of our present knowledge, is unbalanced, because it is insufficiently influenced by the principles that are known to affect the personality of school children.

The child at school is in a dual position. He is his unit self and again he is a unit of any one of a large number of groups, such as his own class, several different departments and the school as a whole. The variations between individual desires and group demands afford abundant opportunities for emotional distresses and conflicts.

It is time to begin the consideration of mental hygiene, then, in its widest educational implications. As I view the subject, mental hygiene is inherent in every problem of education.

Dr. Wile makes certain suggestions as to a state program for mental hygiene within the school system:

The normal school for the training of teachers is a place of vital importance. Here the teacher should learn the organization of children's educational systems and their emotional reaction systems. She should have training in the purpose and interpretation of psychological testing and in methods of remedial teaching, and an appreciation of the specialized classes.

She should gain insight into her own difficulties. The personality of the teacher in the class room is always important. The unhappy teacher just "holding down" her job may do infinite harm.

It is important that the teacher see the mental hygiene potentials in the situation; the effect of success and failure, demotion, skipping a grade, failure in arithmetic, lax room discipline, etc.

Dr. Wile feels that a mental hygiene clinic available to the schools is a basic need. He suggests that on entrance to school each child be placed in a "clearing class" from which he should later be graded after study and size-up with the help of a visiting teacher; and further, an adjustment clinic made up within the school to study disciplinary matters. Discipline should not be punishment; it is guidance rather than a painful mandate. The offence should be viewed as symptomatic and its origin sought.

The combination of a clearing class, visiting teacher, and adjustment clinic would provide for the reasonable introduction of a constructive mental hygiene program into the public school system without great cost. Such a plan could be utilized in cities, large or small, and could be of great service without elaborate organization.—

Ira S. Wile, M.D., Mental Hygiene in the Public Schools, *Mental Hyg.*, XIII, 1: 70–80 (Jan.), 1929.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Post-Graduate Courses in Public Health Nursing—The Education Committee of the N. O. P. H. N. has continued studies of courses in public health nursing, and the report for the past year indicates that there are at present 11 courses in public health nursing meeting the approval of this committee and having the minimum requirements of "a qualified nurse director, affiliation with a school of collegiate grade, a budget, and academic year program with correlated didactic and field instruction."

In studying and grading the various schools, the aim of the committee has been to observe fundamental principles and leave the courses free to develop beyond that, as desired and as indicated by local needs.

Development of instruction and experience in mental hygiene, health education, school nursing and rural nursing are increasing. Some schools have received increased financial support. Closer coöperation between nursing departments and other departments in the colleges is being brought about. Efforts to correlate theory and practice continue to be made with varying degrees of success.

Seven of the 11 schools are connected with a 5-year university nursing program. The number of students enrolled in the schools and their academic and professional qualifications are steadily increasing, but progress would be brought about more rapidly if public health nursing agencies, particularly official health and educational agencies, would demand better qualified nurses.

The work of the Education Committee is to be greatly assisted in the future by the appointment of an educational secretary.—Gertrude E. Hodgman, Post-Graduate Courses in Public Health Nursing, Report of Education Committee of the N. O. P. H. N., *Pub. Health Nurse*, XXI, 2: 93 (Feb.), 1929.

Rural Public Health Nursing Teaching Centers—In the rural field, there is a need for more and better trained public health nurses, which is baffling rural public health nursing supervisors everywhere. Even in the 11 approved schools, the facilities for rural training are too limited to provide training for the rural nurse. Many must still be content with the experience secured on a city staff, however inadequate it may be in preparing them for the different psychological, administrative and health problems of the rural territory.

To meet this situation, certain rural training centers have been developed in different parts of the country without any particular plan of organization. About 8 of these have been studied, and the conditions in them present considerable variation. Some of these centers are under the direction of the state health departments in Alabama, Mississippi, Ohio and New York; some are rural fields used for experience of students in schools of public health nursing in Minneapolis, Minn., Cleveland, O., Richmond, Va., and Nashville, Tenn. Most of them have been selected because of convenient location; some because of good organization.

Advisory public health committees, which are recommended as essential to good administration by the A. P. H. A., were found to be functioning with varying degrees of success in some of the

places studied, while others had no such guidance.

The desirable length of time a student should remain in such a field is agreed to be about 2 months following appropriate theoretical courses, but actually the student's experience has varied from a few days to a few weeks. Much needs to be done to balance the student's experience and teaching in the essentials of office routine, community organization, child hygiene, contagious disease control, sanitation, clinics, group teaching and health education. Of course, much of the success or failure of these training centers will depend upon the personality and professional qualifications of the supervising nurse as well as the preparation of the students.

On the financial side, if the teaching program is well developed, it is sometimes found that students are an expense to the county organization, which must be met in some way. At present, in many instances, the students are receiving some salary for the service which they render during their period in the field.—Pearl McIver, Rural Public Health Nursing Teaching Centers, *Pub. Health Nurse*, XXI, 2: 72 (Feb.), 1929.

Guaranteed Annuities for Nurses—How shall we provide for the time when we are no longer able to follow our profession? This question has been one of the most perplexing in relation to nurses, and especially those engaged in private duty nursing. Inability to count on a secured income very far in advance because of irregular employment has prevented many private duty nurses from tying up their funds in large premium payments involved in the ordinary annuity policy.

A method of saving regularly in small amounts, in order to have an income in the later years of life, is one answer to the question and the solution to the problem for many nurses. The Harmon Association, 140 Nassau Street, New York, N. Y., has announced an annuity plan whereby registered nurses may deposit small sums monthly during their working careers and be assured a monthly income on reaching retiring age.

The fund is to be administered by the Harmon Association for the Advancement of Nursing, lately incorporated, and gifts may be made to the association by persons interested in swelling the annuities for nurses. A nurse may make a deposit according to her circumstances and when ready to retire may cease making payments and receive a monthly guaranteed income as long as she lives.

The plan has been endorsed by the officers of national nursing associations, representing about 100,000 nurses, and is similar to one worked out for teachers by the Carnegie Foundation for the Advancement of Teaching.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Dates Ahead—An encyclopedic help for those who wish to give a timely touch to publicity material or to plan events of timely interest is "Anniversaries and Holidays: A Calendar of Days and How to Observe Them," by Mary E. Hazeltine. American Library Association, Chicago, Ill., 1928. It lists birthdays of notable people, holidays, saints' days and other special occasions with information sources for many of them. Gorgas, Koch, Lister, Osler, Reed, Trudeau, and others are there. Numerous selected references are offered on amateur dramatics, pageantry, costumes, and so on. One method of use is to pick the man or the event you wish to use—in press releases, in a meeting, etc. Another possibility is to find the man or the event of interest to some organization in your community and propose some use by that group in which you can tie up some health message. *Price, $6.00.*

The Labor Blindness Prevention Campaign—An official letter from President William Green of the American Federation of Labor says:

> As was announced to the New Orleans Convention, the American Federation of Labor has worked out with the National Society for the Prevention of Blindness a practical plan for a campaign to conserve eyesight. This plan includes the preparation of educational material and literature which will be printed in the *American Federationist* or in other labor papers.
>
> The society is also prepared to send speakers to address labor bodies and meetings on the various phases of eye conservation. It considers this educational campaign of such great importance that it is willing to pay the expense of sending one of its officers or members of its executive staff to address special meetings of labor organizations where the educational effect will be far reaching. It would be necessary to allow at least 30 minutes for the address, and the speaker must be given a prominent place on your program. Of course, requests for speakers must be made far enough in advance to make possible the necessary travelling as well as to fit in with the itinerary of the various speakers. The National Society will also be glad to send to conventions of state federations or meetings of other large local groups sight conservation exhibits. It will also supply, without charge, a set of four large industrial posters with fliers. The society will also make available to unions selections from its collection of 500 stereopticon slides, charging only for transportation both ways and replacement of broken slides.

This coöperative project offers the possibility of numerous tie-ups for the alert state or local health agency. Write National Society for the Prevention of Blindness, 370 7th Ave., New York, N. Y.

Displays at San Francisco and Minneapolis—Classified displays of publicity and educational material will be features at the headquarters of the Social Work Publicity Council at San Francisco, Calif., June 26 to July 3. Especially for the sake of any Pacific Coast health workers who may not get to Minneapolis in October, it is hoped that many health items will be sent for display, and that health will be well represented in the prize awards for annual reports, feature stories, news photographs, posters, radio talks, and Sunday magazine articles. For details address the Council at 130 East 22d St., New York, N. Y.

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* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

The President Recognizes Public Health—Several departments and other health agencies have quoted from President Hoover's inaugural address:

> In public health the discoveries of science have opened a new era. Many sections of our country and many groups of our citizens suffer from diseases the eradication of which are mere matters of administration and moderate expenditure. Public health service should be as fully organized and as universally incorporated into our governmental system as is public education. The returns are a thousandfold in economic benefits, and infinitely more in reduction of suffering and promotion of human happiness.

"Do Not Kiss Me"—The baby bib has been enlisted for health propaganda by C. V. Craster, M.D., Newark, N. J., health officer. Bibs bearing these words, "Please Do Not Kiss Me—I Do Not Want to Get Sick," are sent to the mothers of new-born infants. It is a striking way of getting an idea over to mothers, and "it has given the mother a method of insisting on her baby's protection without incurring the hard feelings of her friends." Newspaper publicity has been widespread. A picture of the bib appeared in Hamburg, Germany. Letters have come to Dr. Craster from many cities in the United States and Canada from mothers, health officials, teachers, social workers and others. Sample from Department of Health, Newark, N. J., for 10 cents. Quantities with name of your department or association from Walsh Hospital Supply Co., Lincoln Park, Newark, N. J. 1,000 for $85.00.

Denver Survey Recommendations—The following recommendations for popular health education appear in *An Appraisal of Public Health Activities in Denver, Colorado:*

> 1. That, based on the needs outlined in connection with this study, a program of popular health education be planned, which will include as completely as possible the recommendations made by the committees dealing with the specific health activities, to the end that a well-rounded program may be undertaken and carried out.
>
> 2. That, since the newspaper is the most important medium for conveying information to the public, plans be worked out for the more general and regular use of the newspapers as a means of securing wide dissemination of information on health matters.
>
> 3. That, in addition to a more liberal distribution of pamphlets and bulletins on health, arrangements should be made for the establishment of a Speakers' Bureau, so that there will be available at all times some persons who are well qualified to speak on subjects relating to Public Health.

Specific recommendations for educational activities appear under "Venereal Disease Control," "School Hygiene," "Food and Milk Control," and "Heart Disease Control." A big job is laid out. There are no budgetary or personnel recommendations. Published by Denver Public Health Council. 50 cents.

Classification of Printed Matter—According to *Postage and Mailbag:*

> If you will classify the various physical kinds of direct-mail according to their outstanding capabilities, they will fall definitely into these four groups:
>
> 1. *Continuity* (good will), house organ, mailing cards, booklets, pamphlets, package or letter inserts
> 2. *Action* (sales, inquiries), letters, all kinds, broadsides, self-mailing folders, unbound folders
> 3. *References* (information, data), catalogs, books, portfolios, maps, blue-prints
> 4. *Reminder* (name, location, business), blotters, calendars, post cards, novelties
>
> Having this classification in mind, if you will decide what it is your proposed piece is to accomplish, you will have little trouble locating the format in one of these groups.

A "Hunch" for Editors—The following from *Editor and Publisher* (Mar. 23, 1929) might interest one of your local editors:

> Those news editors who find their hospitals a difficult source of news might follow the example of a paper which recently carried a series of Sunday features describing one such institution each week, its history, et cetera,

illustrated with the cut of the present building, the superintendent and the head physician. The series supplied not only interesting reading matter but established good will with several important news contacts.

When a Governor Speaks—Governor H. H. Horton, of Tennessee, stated several major objectives of the State Department of Health in urging favorable action on the proposed budget of the department. The department will supply a copy of the statement.

HOUSE ORGANS

One of few house organs with a real community coverage, except the one so long issued by the Brookline, Mass., Department of Health, will be *Health News*, "Bellevue-Yorkville's Picture Newspaper." The first issue (see under "Diphtheria") was followed by one on tuberculosis. It is proposed to publish *Health News* monthly, with 40,000 copies to be delivered by a distributing concern. Copies of the first 5 issues will be sent as they appear for *25 cents* Address Marjorie Dent Candee, 325 East 38th St., New York, N. Y.

"Facts Taken from the Annual Report of Buffalo of 1857," in *Sanitary Bulletin*, Buffalo Department of Health, suggests interesting copy for use in many other cities.

Modern Health Crusader, 209 College St., Burlington, Vt., now appears in magazine size, with a stiff paper cover. "High School Revue" is a new idea for a special department.

SCAA News, New York, has been "dressed up" with new type—to increase attractiveness and readability.

Yours for Health is the new 4-page multigraphed monthly of the Racine Department of Health, taking the place of the former weekly mimeographed bulletin.

The *News Letter* of Dutchess Co. Health Assn., 16 Cannon St., Poughkeepsie, N. Y., goes monthly to 475 "doctors, nurses, board and committee members, supervisors and other good citizens of the country." The March, 1929, issue tells about the work done in getting out the *Letter* and asks readers to answer seven questions.

Will those who have asked readers what they thought about their organ, or what readers wanted to read, please report?

CAMPAIGNS

"To stimulate state-wide activity in child health improvement, the Indiana Child Hygiene Division is devoting 6 weeks to the initiation of health projects which will culminate on May Day." Details in *Monthly Bulletin*, Indiana State Board of Health, Jan., 1929. An elaborate program of possibilities. Includes questionnaire covering: health inventory, family, home, child, school.

"Putting On a Health Week," by E. O. Chimene. *Hygeia*. Mar., 1929. How Austin, Tex., did it. With organization chart.

SCHOOLS AND CHILDREN

"Danny Dentin in His Barrel" is a simple, home-made device invented by Neva Bushong, La Grange County (Indiana) nurse, to encourage correction of dental defects. Two sketches of "Danny" in *Echoes*, Indiana State Board of Health, Jan., 1929. *Free.*

Did you read "Candy—A School Health Problem" on page 69 of *Hygeia*, Jan., 1929, and also "Stalking the Food Faddist" by the Sugar Institute, on page 97?

For public and private schools having classes in French, pamphlets and other health material might be secured at reasonable rates from the Association de Propaganda pour la Protection Medicale et Hygienique de la Mere et de l'Enfant, 4, rue de Sevres, Paris, France. Price list upon request.

From the Shenango Valley Community Fund comes a story form which suggests possible uses by health work-

ers. "The Twins' Adventures in 'Heart Land'" opens as follows:

Jack and Marie were called "the Melville twins" by all who knew them. They were always (1) together, this brother and sister of (2) years.

"What shall we do today?" asked Marie of Jack, one (3) day in (4).

"Well," said Jack, "I see that the Community Fund is going to hold its annual campaign (5)."

On the last page are "Definitions of the Words to Put in the Blank Spaces," for example: (1) Viewed; (2) One dozen; (3) Not dark; (4) Tenth month of the year; (5) Fourth Monday in October to fifth Monday.

"The many requests received in our School Health Bureau indicate the need for definite and detailed descriptions of successful school health programs," says the Metropolitan Life Insurance Company. The response took the form of "A School Health Study of Newton, Mass." 88 pages. *Free.*

PUBLIC SPEAKING

"Whom Shall We Have as Speaker?" is the new list of topics and speakers offered to the public by the Speakers' Bureau of the Community Chest and Council of Social Agencies, 312 West 9th St., Cincinnati, O. Health topics are listed under "Health Programs and Problems," "Health Instruction," "Child Health," "Mouth Hygiene," and "Mental Hygiene." Some topics: "Next Door to Trouble" (by Chief Sanitary Inspector); "The Watchman at the Gate" (Chief Food Inspector); "Youth and Life and Commonsense" (Advisor for Girls, Woodward High School); "Fashions in Health" (Public Health Federation); "Beauty Products" (Nutrition Worker); "Tooth Truths" (Public Dental Service Society). Copy for *4 cents.*

Does the above prompt you to propose that a similar list be issued by the local chest or council of social agencies, or the group of local health agencies?

"A Public Speaking Clinic," in *Woman's Journal,* New York, N. Y. (Feb., 1929), describes a class and clinic conducted by a Los Angeles woman's club. To an increasing extent civic, social and health agencies are conducting classes or holding clinics in public speaking.

EDUCATION NEEDED

"The remedy for the menace of the quack in this field ('female cures'), as in all the other fields of quackery, is education. Women are gulled not because they lack intelligence but because they lack knowledge."—In "Female Weakness Cures," by A. J. Cramp. *Hygeia.* Mar., 1929.

HONORABLE MENTION

To California Department of Health: For detailed table of contents in Biennial Report.

To Pasadena, Calif., Health Department: For an annual report with an index, and an organization chart of the Department.

DO THEY NEED EDUCATION?

Note to teacher from parent: "If that nurse comes to school today to stick the children, send my children home. They wear asafetida to keep away diseases."—Reported by Nolan County, Tex., nurse while conducting a diphtheria campaign.

NEW PERIODICALS

Human Biology, Baltimore, Md., edited by Raymond Pearl.

Red Cross News, Toronto, Ont., organ of Canadian Red Cross.

Social Science Abstracts, Fayerweather Hall, Columbia University, New York, N. Y.

BOOKS AND REPORTS

Getting Ready to be a Mother—*(2d ed. rev.) By Carolyn Conant Van Blarcom, R.N. New York: Macmillan,* 1929. 286 pp. Price, $1.75.

This manual for mothers is a handy little volume, well printed on good paper and with many excellent cuts. The first edition appeared in 1922.

A book like this is presumably of most use to well-to-do, educated women. It would seem rather "highbrow" to the prospective mother with a grammar school education only. Furthermore—to give the unfavorable criticisms first—the book goes into too great detail in places, especially for the patient who is going to take the excellent advice given of engaging a physician early and following his directions. It is a question how much value there is to the amount of anatomy and embryology incorporated into chapters three and four. A little knowledge is often not only dangerous but upsetting and leads to morbidness, only too common during pregnancy. Again, the dietary advice in the later chapters is somewhat complicated and unduly restrictive.

It seems rather unwise to retail contradictory recommendations: it weakens the force of all. One should either lay down definite rules or else leave it to the physician to do. The fact that some physicians are said to advise so and so and others the opposite, leaves the poor patient, like the ass in the fable, not knowing which way to turn. Powdered milk is damned openly on page 196 and faintly praised on page 197, rather without justification in the light of more recent studies. Pasteurization, too, is treated in rather stepmotherly fashion.

One is a bit surprised to find little or no reference to the part that the visiting nurse may play as contrasted with the nurse who devotes her whole time to the one patient. There might be, with advantage, a little greater stressing of the vast importance of attention to diet during the prenatal period if the baby is to have proper teeth.

On the whole, the book is a most useful one and justifies its continued popularity. Its shortcomings, few in comparison with its strong points, have their roots in a desire on the part of the author not to trespass on the rôle of the attending physician—a rôle which he too often does not fill to the complete satisfaction of the anxious and inquiring patient.

It would seem that this book might be of value to nurses as well as to the more intelligent mothers, particularly in its chapters on the technic of the baby's toilet, and to most physicians too.

MERRILL E. CHAMPION

A Doctor's Letters to Expectant Parents—*By Frank Howard Richardson, M.D. New York: Norton,* 1929. 118 pp. Price, $1.75.

This series of letters is well written with an eye to answering the questions, spoken and unspoken, which trouble most prospective parents, fathers as well as mothers. It was a fine human touch to address some of the letters to both mother and father. The preface to the book rightly stresses this feature as more or less unique, as is also the emphasis laid on the psychological side of pregnancy—in many cases, quite the most important aspect.

Health departments more and more are using such letters to prospective mothers. The great difficulty they find is in preparing letters intelligible to the

less educated and yet not trivial in the eyes of the educated. Dr. Richardson evidently appeals to the latter class only; from the point of view of the purveyor of popular health literature his letters are decidedly "highbrow." On the other hand, they carefully avoid anatomical and physiological details which are unessential to the lay reader.

Certain especially good points may be referred to: a good talk to parents on the need of forbearance; another on the frank recognition of the drawbacks of pregnancy, both physical and emotional; "maternal impressions" is sensibly handled. There is sound advice about preparing the other children in the family for the coming of the new baby. Breast feeding, as one would expect from Dr. Richardson, is well handled.

One or two minor criticisms might be made. A little more detail might well be gone into concerning a well rounded diet. A rather unduly strong impression is left regarding the danger of attending to the mother's teeth late in pregnancy. Hospital care gets a little too much praise in view of statistical evidence of unfavorable mortality experience in hospital cases. The author runs up against the dilemma, inevitable when one physician gives advice to another physician's patients, of saying too little or too much: if he does not go into detail, the patient may not be told some essential things; if he does, he may be giving advice with which the family physician will disagree, leaving the patient wondering which is right.

On the whole, this little book will bring confidence and satisfaction to many a mother—and father, as well.

MERRILL E. CHAMPION

Children's Behavior and Teachers' Attitudes—*By E. K. Wickman. New York: Commonwealth Fund,* 1928. 247 pp. Price, $2.00.

The far-seeing public health worker is taking an active interest in the literature of mental hygiene and the problems of education. That many health programs (in the broadest sense) have failed in dealing with children of school age, has been due to lack of background on these two fields.

The present book is a very striking contribution to the literature of both mental and school hygiene (again used in a broad sense). Why do teachers consider certain pupils perfect blessings and other pupils, with different characteristics, the precise opposite? The truth is that teachers seem to set up standards of behavior which best meet their own comfort and happiness. That they favor the quiet, well behaved, even timid child would be obvious. On the other hand, the qualities of success seem to lie to a considerable extent in the very aggressiveness, or "attacking" personality, which teachers find disturbing to their discipline and displeasing to their personal preferences. That much good human material is lost through failure to recognize the seriousness of the "withdrawing" type of personality, and that such children are potential hermits unless changed into good social assets; loses prominence through the insidious peacefulness of the school situation created by the withdrawing types of pupils. Nor will the "tiger tamers" and subjugators get the best results from the "attacking" type of children.

Teachers, more than parents, resist attempts to modify behavior patterns because both their professional pride and their self-respect are involved.

Other blocks to progress among teachers are strong present habits, lack of opportunity to practice new procedures, and strong emotional and social maladjustment to the very problems which arise to distress adults in the behavior of children. The teacher's whole philosophy of life, every attitude, is reflected in behavior, and many a teacher is maladjusted. The answer is in the

study and treatment of behavior problems of children, with every classroom a laboratory.

The author leaves one with the impression that teachers as a class can scarcely be considered leaders; that they would do well to "cast out the mote" in their own eyes; that they must spend far more time and thought in professional improvement, at least along lines of social adjustment problems. It might be well to contemplate, in a broader view of the situation, just why many teachers are socially maladjusted. Are they so when they enter the profession? or does the profession in some way change them? The reviewer has his own theory based on studies made in New York State some years ago.

At any rate, this report of a well planned and adequately completed piece of research, is worth the careful attention of anyone who is, even in the vaguest sort of way, in contact with public schools—and that means most of us in the health field.

HUGH GRANT ROWELL

Your Teeth—*By Charles I. Stoloff, D.D.S. New York: E. P. Dutton,* 1928. 224 pp. Price, $2.50.

The cover makes a good impression. It looks like last month's contribution of the Literary Guild. Its wide margin and novel-like proportions keep up the illusion.

The title might well be "Your Teeth, Past, Present and Future," for Dr. Stoloff, though he includes the care of children's teeth, is thinking of the reader as an average American adult with a badly crippled dental machine in constant need of repair and possibly replacement in the future. It is perfectly true that practically all of the popular dental literature written to date is concerned with the child and the prevention of dental troubles. Dental health workers who have felt that the present generation was hopeless, dentally speaking, will be startled by the frankness with which Dr. Stoloff presents the opposite viewpoint on this question. It is also true that types of reparative work are seldom discussed by the average "family dentist." Most members of the dental profession have never felt it necessary to outline the advantages and disadvantages of a fixed versus a removable bridge, or a crown versus an inlay. Dr. Stoloff's point of view is well expressed in the following paragraph:

> An astonishing thing about the contemporary dental educational work is the utter lack of information to such unfortunates—and few of us there are who are not included—whose teeth require repairing or replacement, after the prophylactic (preventive) failure of the most rigid prescribed mouth hygiene. Why should there be more mystery about what is deemed good practice in reparative dental work, than what is considered to be good mouth hygiene?

The order in which the author presents his material is somewhat illogical, as the positive side of the picture, including general information on the two sets of teeth, their formation and care, is given before a discussion of treatment, removal and replacement and at the very end of a long description of root canal work, bridges and plates, appears Prenatal Care and the care of the mouth (tooth brushing)! Diet, though mentioned throughout, is formally introduced under Miscellaneous, with Halitosis, X-ray and Cancer.

Many disputed questions are answered by simple, clear-cut but conservative statements.

Much of the matter concerning the preventive side of mouth hygiene will be unsatisfactory to dental hygienists; for instance, the figure of tooth brushing on page 186, which shows the brush moving cross-wise over the teeth; and such advice to mothers, as on page 38: "If any cavity should form have it filled as soon as it is noticed." It is generally agreed that a mother should take her child to the dentist at frequent intervals (three or four months at this

age) whether she notices cavities or not.

The following, page 67, is surprisingly negative:

> Decay starts very frequently on the biting surfaces in the grooves (technically called fissures) because there may be minute cracks in the enamel at such points which make it difficult, or most impossible to clean thoroughly. Due to the frequency with which teeth decay in these fine "fissures" *there are dentists* who advocate drilling them out and filling them even before any visible evidence or sensation gives warning that the teeth are decaying

in view of the fact that the American Dental Association passed the following resolution as far back as 1926:

> RESOLVED, that in the aim to attain prevention of systemic and dental disease—(a) No defect is too slight to receive definite attention. (b) The temporary teeth should receive as much care as the permanent ones in order to promote the proper development of the jaws and head, and to maintain function. (c) Particular care and attention should be given to developmental pits and fissures, whether occurring in primary or secondary teeth, or whether decay is or is not present.

The line drawings are a good feature and will help to make the book useful in clinics and schools as well as in the waiting rooms of dentists, where it most certainly belongs.

ELEANOR G. MCCARTHY

The Bureau of Dairy Industry. Its History, Activities, and Organization—*By Jenks Cameron. Baltimore: The Johns Hopkins Press,* 1929. 74 pp. Price, $1.50.

The fifty or more service monographs of the United States Government issued by the Institute for Government Research have been prepared according to a uniform plan, but they are written by different authors of various capabilities. The style of the writer of this particular monograph often makes the reader wince, for the author seems to suffer the delusion that he must be clever and fill up space with poor puns and esoteric expressions. He mentions the "ultimate ungodly hour of up-betimesism," whatever that means, and informs us that "the case against American cheese was as strong as the cheese itself." He employs words like "sanitational" and "dissemination al" which seem so far to have eluded the dictionary. The editor as well as the author is at fault for such slovenly writing, and incompetent editing is seldom excusable.

Despite the occasionally atrocious style and the careless editing, this small book is packed with useful information about an important federal bureau, and anyone interested in dairy work will find it valuable for reference and even perusal. In addition to the historical account of the development of the bureau and its activities, there is a description of its organization, and also appendices giving laws, financial facts, and other useful data. The book contains a good index and a fairly adequate bibliography. It is well printed, though one g l a r i n g error, "sport" when "spore" was meant, got past the editor and typographer. JAMES A. TOBEY

The Harvey Lectures—*Delivered under the auspices of the Harvey Society of New York, 1927–1928. Series XXIII. Baltimore: Williams & Wilkins,* 1929. 280 pp. Price, $4.00.

The Harvey Lectures have deservedly won their place in medical literature. The present volume is no exception to the high standard which has been consistently maintained. It contains eight lectures, all giving comprehensive reviews of important subjects. More of them concern new problems and methods than has been usual in the past. An address on Harvey given at a dinner in commemoration of the 300th anniversary of the publication of his epoch-making work is included. Only one of the lectures—that on tularemia—is of direct public health interest. All, however, are important and of unusual excellence.

The printing and make-up of the book are good. M. P. RAVENEL

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Darke County, O.—This county health unit functions under a coöperative arrangement whereby the expenses involved are shared by the general district board of health, the city of Greenville, the State Department of Health and the Rockefeller Foundation. A total of 29,547 services were rendered, of which 19,707 were in the county area, and 9,840 in the city. Nursing home visits numbered 6,162, including, among others, prenatal, maternity, infant, preschool, tuberculosis, school and communicable disease visits. There were 9,877 services rendered by the inspection division.

Sanitary and health surveys were completed in 6 incorporated towns and in the 20 townships of the general districts. Every house in the city of Greenville and the 18 incorporated towns, and every farmhouse in the county was visited. In conjunction with the county unit, a training station for health workers has been maintained throughout the year by the Rockefeller Foundation and the State Department of Health. For every $100 spent from tax funds in the county district, 56 cents were spent by the Board of Health. The total expenditures for the year by all agencies amounted to $35,900, including expenses for the maintenance of the training station.

Lincoln, Neb.—Lincoln's 1928 report indicates certain changes in organization of a progressive nature. The child welfare bureau and pediatric clinic have been placed in the hands of a deputy superintendent and pediatrician. A general clinic is in the hands of a deputy superintendent and only those patients above 14 years of age are there treated. Tuberculosis patients are treated in both the pediatric and general clinics. A public health and obstetrical nurse have been added to the health staff. On the basis of a population of 70,000, a birth rate of 13.2 and a general death rate of 12.3 were recorded.

Walla Walla, Wash.—The annual report of the city and county health department for the year ending May 31, 1928, indicates a population of 28,130, a birth rate of 14.01, and a crude death rate of 13.21, with an infant mortality rate of 44. The average age at death for the year was 57. During the year, 57 per cent of the births and 42 per cent of the deaths occurred in hospitals. A card index is kept of all communicable diseases, and of the vaccination and diphtheria immunization records of each public school pupil.

The Commonwealth Fund—Appropriations totalling $2,083,622 were made by the Commonwealth Fund last year in furthering a wide range of public health, mental hygiene, child welfare and educational activities, according to its tenth annual report. Modern fifty-bed hospitals have been awarded to 5 communities since the beginning of the Fund's rural hospital program, for which $358,438 was appropriated during the year. The first of these was opened in Farmville, Va., in November, 1927. The institutions in Glasgow, Ky., and Farmington, Me., will be completed this spring, and those in Beloit, Kan., and Wauseon, O., will probably be opened before the end of 1929. According to the report:

> The rural hospital program is an experiment in social organization involving much more than a building project; it is an effort to attack from a fresh angle the difficult problem of medical and public health service in small towns and the open country, and to change

community standards in respect to the care of the sick, the prevention of disease and the protection of health.

Typical of the general program is the work now going on in the district of 9 Virginia counties served by the Farmville Hospital. The State Health Department has organized this territory into a single unit with a district health officer, under whose leadership a comprehensive health service is being gradually developed. Two medical institutes have been held, with clinical demonstrations and lectures on chosen topics. Ten local physicians have been awarded fellowships for brief postgraduate courses at well-known medical centers. The hospital itself is proving its usefulness to the community and has been operated under the direction of the local Board of Trustees on a gratifyingly high standard. As with all hospitals constructed under the Fund's cooperative program, a third of the cost of the building and equipment and the entire expense of administration have been assumed by the local community.

Experience in carrying on for the past six years a program for the development of child guidance clinics and visiting teacher service in the public schools has brought the conviction that the greatest present need in this field is the adequate training of sufficient personnel. The Fund's chief contribution toward meeting this need has been the Institute for Child Guidance, opened in New York City, July 1, 1927, and now in its second year of operation as a clinic and training center. The student group now includes 7 psychiatrists, 5 psychologists, and 44 psychiatric social workers who are specializing in work with children. For several years the Fund has assisted in a program for the development of child guidance clinic work in England. A special service and training clinic will be opened in the spring of 1929 under the auspices of the Child Guidance Council of Great Britain.

The program of five-year demonstrations of child health work which the Fund undertook in 4 American communities is drawing to a close. The work in Fargo, N. D., was completed at the end of 1927 and full reports of the results have been published during the past year. The demonstrations in Rutherford County, Tenn., and in Athens and Clarke County, Ga., ended in December, 1928. The work in Marion County, Ore., is entering upon its final year. Local appropriations and arrangements for carrying on all essential activities at their own expense have been made in these communities. In Rutherford County, particularly, the report finds " an outstanding example of the possibilities in public health created in a rural community by an awakened public conscience."

On July 1, 1929, the Fund expects to complete the program of child welfare and public health work in Austria which it took over in 1921. The various child health stations will be continued by the Austrian authorities, a new emphasis is being placed upon the adequate training of personnel, and the whole program promises to be successful beyond the hopes that were entertained when the work was begun.

Among the 43 special grants made by the Fund for public health, mental hygiene, and miscellaneous welfare projects during the year, the following may be noted: to the American Public Health Association for the study of public health programs in rural areas; for fellowships in psychiatry at the Boston Psychopathic Hospital, the Henry Phipps Psychiatric Clinic at Baltimore, and the University of Colorado Medical School; to the National Conference of Catholic Charities for a study of child caring homes; to the Boy Scouts of America for a study of the effects of scout work in a number of American cities; to the New York Tuberculosis

and Health Association for cardiac research; and to the American Forestry Association for a program of education looking toward the conservation of forest resources in three southern states.

Orange County, Calif.—This county has an area of 800 sq. mi. and an estimated population of 135,000, according to the 1928 report. The school population of the territory registers 21,387. A general death rate of 8.9 and an infant mortality rate of 73.5 are reported. Heart disease was the cause of death in 1 out of 5 instances.

Present-day preventive medicine is recognizing that it has a nation wide problem in heart disease, and is trying to meet this problem by urging upon the public frequent and regular physical examinations in the physician's office and at school, in order that heart maladies may be found early and perhaps remedied or at least protected from strain before a permanent injury has resulted.

During the year 3,992 complete courses of toxin-antitoxin were administered, 10 per cent being among preschool children. There were 16 cases of typhoid fever, but no deaths. A tuberculosis death rate of 73.8 per 100,000 population is noted. Sixty-nine new cases were reported during the year. Fourteen diagnostic clinics were held, and 468 examinations were made. Thirty-four patients are hospitalized in the new tuberculosis pavillion at the County Hospital and 29 under-nourished children are in attendance in the all-year health camp and preventorium maintained in the Santiago Canyon by the County Tuberculosis Association.

BOOKS RECEIVED

THE HUMAN FACTOR IN INDUSTRY. By E. P. Cathcart. New York: Oxford, 1928. 105 pp.

THE LAWS OF PENNSYLVANIA RELATING TO SOCIAL WORK. Compiled by John S. Bradway. Philadelphia: Public Charities Association of Pennsylvania, 1929. 261 pp. Price, $2.50.

TUBERCULOSIS AND HOW TO COMBAT IT. (2d ed.) By Francis M. Pottenger. St. Louis: Mosby, 1928. 275 pp. Price, $2.00.

THE PHYSICAL WELFARE OF THE SCHOOL CHILD. A Textbook in School Hygiene and Health Work in the Schools for Normal Schools and Colleges. By Charles H. Keene. New York: Houghton, Mifflin, 1929. 505 pp. Price, $2.40.

COMPARATIVE NEUROLOGY. By James W. Papez. New York: Crowell, 1929. 518 pp. Price, $6.00.

PRACTICAL CLINICAL LABORATORY DIAGNOSIS. (3d ed.) By Charles C. Bass and Foster M. Johns. Baltimore: Williams & Wilkins, 1929. 187 pp. Price, $7.50.

HANDBOOK OF MICROSCOPICAL TECHNIQUE. Edited by C. E. McClung. New York: Hoeber, 1929. 495 pp. Price, $8.00.

MANSON'S TROPICAL DISEASES. (9th ed., rev.) By Philip H. Manson-Bahr. New York: Wood, 1929. 921 pp. Price, $11.00.

YOUTHFUL OLD AGE. How to Keep Young. By Walter M. Gallichan. New York: Macmillan, 1929. 236 pp. Price, $2.50.

NUTS AND CITRUS FRUITS, by Francis C. Owen, and STORY OF THE CITRUS FRUITS, by Ellen M. Ramsay. Dansville, N. Y.: F. A. Owen Pub. Co., 1928. 128 pp. Price, $.72.

HANDBOOK OF BACTERIOLOGY. (2d ed.) By Joseph W. Bigger. New York: Wood, 1929. 452 pp. Price, $5.00.

FIVE YEARS IN FARGO. Report of the Commonwealth Fund Child Health Demonstration in Fargo, N. D. New York: Commonwealth Fund, 1929. 297 pp. Price,

THE BIOCHEMISTRY OF THE AMINO ACIDS. By H. H. Mitchell and T. S. Hamilton. American Chemical Society Monograph Series. New York: Chemical Catalog Co., 1929. 619 pp. Price, $9.50.

THE FACTS OF MODERN MEDICINE. By Francis W. Palfrey. New York: Appleton, 1929. 490 pp. Price, $5.00.

UNITED STATES CONTROLLED OZONE. A Popular Scientific and Engineering Treatment of the Production of Ozone and Its Industrial Application. Bulletins Nos. 50 and 51. Chicago: United States Ozone Co., 1929. 66 pp.

DIAGNOSTICS AND TREATMENT OF TROPICAL DISEASES. (5th ed.) By E. R. Stitt. Philadelphia: Blakiston, 1929. 918 pp. Price, $9.00.

PRACTICAL MILK QUALITY TESTS. Used in a System of Milk Control. By Valdemar Christensen. Cincinnati: Ohio Food and Dairy Laboratory, 1929. 86 pp. Free.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

International Public Health—A report of the session of the International Office of Public Hygiene which includes a consideration of the world-wide aspects of venereal diseases among seamen, yellow fever, plague, and outbreaks of other communicable diseases, infant hygiene, etc.

ANON. Regular Session of the Permanent Committee of the International Office of Public Hygiene, Oct., 1928. Pub. Health Rep., 44, 13: 711 (Mar. 29), 1929.

Health Guidance for Girls—An account of the "Girl's Health Trail" designed to focus attention upon tuberculosis in girls of high school age and to stimulate health habits. The machinery developed to carry out the plan in Wisconsin is described.

ANON. Wisconsin Girls Hit the Trail. Survey, 61, 12: 809 (Mar. 15), 1929.

Cancer and State Medicine—Dr. Bigelow tells of the work of the Massachusetts cancer program and makes it the basis of a plea for the medical profession to join with the health officer in solving the inadequacies of present-day treatment facilities—all done in Dr. Bigelow's inimitable way. It should be read by every health worker.

BIGELOW, G. H. Is the State's Cancer Program State Medicine? New England J. Med., 200, 9: 438 (Feb. 28), 1929.

Venereal Disease in New York—Another incidence study of venereal infection, this time in two counties of New York City (Staten Island and Brooklyn). The remainder of the city is to be reported upon later.

BRUNET, W. M. Venereal Disease Prevalence in the City of New York. Long Island M. J., 23, 2 and 3 (Feb. and Mar.), 1929.

Vitamin B in Infant Feeding—Some substance containing vitamin B should be added to the infant's diet just as orange juice and cod liver oil are added to supply the other vitamins. Wheat-germ sugar is the substance recommended to supply the vitamin B factor. Pity the poor yeast advertiser!

DENNETT, R. H. Routine Use of the Vitamin B Factor in Infant Feeding. J. A. M. A., 92, 10: 769 (Mar. 9), 1929.

Measles Serum—Dr. Ferry reviews the evidence which confirms his belief that measles is probably caused by a pleomorphic streptococcus.

FERRY, N. S. Etiology and Specific Treatment of Measles. Am. J. Dis. Child., 37, 3: 572 (Mar.), 1929.

Cleanliness—Practically a poem in praise of cleanliness, this British paper extols cleanliness of the skin, cleanliness of the air, cleanliness of food and water, cleanliness of soil (including our old friend "effluvia"), cleanliness of dwellings and streets. In conclusion, the reader is informed that it is the true basis of all health conservation.

HILL, A. B. Cleanliness: Is It the Basis of Health? J. Roy. San. Inst., 49, 9: 571 (Mar.), 1929.

Minerals in Nutrition—An excellent summary of the rôle of calcium, phosphorus, sunlight, irradiated foods, ergosterol, and the like, written especially for nurses. The article should be of value to health officials who are concerned with health promotion but who are not conversant with the details of research in nutrition.

KOEHNE, M. The Mineral Requirements of the Body. Pub. Health Nurse, 21, 3: 125 (Mar.), 1929.

The Burden of Heart Disease—Heart disease, in terms of incidence and death and loss of means of livelihood, falls more heavily on the underprivileged man and woman than upon the higher social levels. The burden is greater than in all other diseases except tuberculosis, mental defects and chronic arthritis, and increases with each decade in life from 25 to 65.

EMERSON, HAVEN. Economic Aspects of Heart Disease. Am. Heart J., 4, 3: 251 (Feb.), 1929.

Marriage and Divorce—Health officials will be interested in this statistical summary of divorce, if for no other reason than that they are the keepers of vital statistics. But all will be stimulated by the author's philosophical discussion. One observation is priceless. He says: "The obligation accepted at marriage for better or for worse . . . may be more correctly interpreted as for better or for divorce."

HOFFMAN, F. L. Marriage and Divorce J. Social Hyg., 15, 3: 129 (Mar.), 1929.

Typhus Fever—A method is proposed for distinguishing the American strain of typhus fever (Brill's disease) from old world typhus. Formerly there was no immunologic distinction between the two forms.

MAXCY, K. F. Endemic Typhus Fever of the Southern United States: Reaction of the Guinea Pig. Pub. Health Rep., 44, 11: 589 (Mar.), 1929.

Typhoid Fever Outbreak—Another typhoid fever outbreak traced to chicken salad infected by a carrier. It was served this time at a wedding breakfast instead of the usual harvest home or church supper.

MINER, H. E., and FORSBECK, F. C. An Outbreak of Typhoid Fever Traced to Chicken Salad Infected by a Carrier. New England J. Med., 200, 9: 440 (Feb. 28), 1929.

How to Reduce Maternal Mortality—The continued high maternal mortality rate, higher in cities than in rural regions, will be lower when we have better obstetrical training for physicians, midwives and nurses, says this author. A more widespread knowledge and a clearer understanding of the importance of proper maternity care is also mentioned.

RICE, F. W. The Problem of Reducing Mortality Associated with Childbirth. New York State J. Med., 29, 5: 262 (Mar. 1), 1929.

Fatigue in Industry—The effect of fatigue upon the health and life of industrial workers and the influence of heat upon fatigue are discussed. The experience is with miners and steel workers in Great Britain.

VERNON, H. M. The Fatigue of Heavy Industrial Work, and Its Influence on the Health and Duration of Industrial Life. J. State Med., 37, 3: 141 (Mar.), 1929.

Irradiated Ergosterol—Another study indicating the value of irradiated ergosterol in the treatment of rickets. A commercial preparation was used and proved to be well tolerated and effective.

WILKES, E. T. The Treatment of Rickets with Irradiated Ergosterol. Am. J. Dis. Child., 37, 3: 483 (Mar.), 1929.

Rats on Shipboard—All about rats, their fleas, and the rat proofing and fumigation of ships.

WILLIAMS, C. L. A Rat and a Rat-Flea Survey of Ships at the Port of New York. Pub. Health Rep., 44, 9: 443 (Mar. 1), 1929.

Glass Transmitting Ultra-violet Light—Experience with two types of glass permitting the passage of ultra-violet rays, "Corex" glass and "Vita-glass," indicated the superiority of the former.

WYMAN, E. T., et al. The Value of Different Types of Glass for Transmitting Ultra-violet Light. Am. J. Dis. Child., 37, 3: 473 (Mar.), 1929.

NEWS FROM THE FIELD

SUMMER SCHOOL COURSES IN PUBLIC HEALTH

THE following universities and technical schools are offering courses in public health and preventive medicine during their summer sessions. While this is not a complete list of schools giving such courses during the summer, it represents those replying to a questionnaire from the American Journal of Public Health and The Nation's Health.

UNIVERSITY OF CALIFORNIA, Berkeley, Calif. July 1–August 10
Social Hygiene
Child Welfare
Health of the School Child
Introduction to Statistical Method
Subject Matter and Technique in the Teaching of Home Hygiene and Care of the Sick
Preventive Medicine
Public Health Nursing
Administration of Schools of Nursing
Supervision in Schools of Nursing

UNIVERSITY OF CHICAGO, Chicago, Ill.
June 17–July 24 (First Term)
July 25–August 30 (Second Term)
Hygiene and Bacteriology
Public Hygiene
Immunity in Relation to Preventive Medicine
Public Health Problems
Sanitary Surveys
Public Health Nursing
School Hygiene
Physical Education
General Bacteriology
The Pathogenic Bacteria
Public Health Laboratory Methods
Parasitology
Epidemiology
Industrial Hygiene (First Term)
Public Health Engineering (Second Term)
Health Education
Personal Hygiene
Physiology of Nutrition
Statistics

COLUMBIA UNIVERSITY—DeLamar Institute of Public Health, College of Physicians and Surgeons, New York, N. Y. June 10–June 28
School Health Supervision
—Teachers College, New York, N. Y. July 8–August 16
Home and Community Hygiene
Child Hygiene
Public Health Administration
Mental Hygiene
Administration of Health Work in Schools
Teaching Problems in Health Education
Methods of Health Education
Public Health Nursing
Methods of Teaching in Sight Conservation Classes
Methods of Teaching Lip-reading to Deafened Children

CORNELL UNIVERSITY, Ithaca, N. Y. July 6–August 16
Physical Education
Measurements of School Children
Hygiene of the School Child and Adolescent
Health Inspection of School Children
Gymnastics and Dancing

DUKE UNIVERSITY, Durham, N. C.
June 10–July 20 (First Term)
July 22–August 29 (Second Term)
Research in the Organization and Administration of Health Education
Methods in Health Education
Physical Education
Personal and School Hygiene

HARVARD UNIVERSITY, Cambridge, Mass. July 8–August 17
Principles and Problems of Hygiene
Physical Education

UNIVERSITY OF ILLINOIS, Urbana, Ill. June 17–August 10
Organization and Supervision of Health Education in the Elementary Schools
Physical Education

THE STATE UNIVERSITY OF IOWA, Iowa City, Ia.
June 10–July 20 (First Term)
July 22–August 24 (Second Term)
Hygiene
Hygiene of Swimming Pools, Gymnasiums and Camps
Principles of Physical Growth and Measurements
Supervision of Public School Physical Education
Care of Student Health—Physical Diagnosis
Physical Education in Junior and Senior High Schools
Hygiene and Sanitation

JOHNS HOPKINS UNIVERSITY, Baltimore, Md. July 1–August 9
Preventive Medicine and Hygiene
School Sanitation and Vital Statistics

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, Mass. July 1–August 13
Methods of Teaching General Biology
Bacteriology
Health Education Methods
Hygiene of the School Child
Public Health Laboratory Methods
Public Health Institute for Health Officers and Other Public Health Workers

UNIVERSITY OF MICHIGAN, Ann Arbor, Mich. June 24–August 3
General Hygiene and Public Health
School Hygiene
Methods and Materials in Health Education
Child Hygiene
Principles of Public Health Nursing
Organization and Administration of Public Health Nursing
Applied Nutrition
Mental Hygiene
Vital Statistics
Epidemiology
Public Health Administration
Public Health Institutes

MICHIGAN STATE COLLEGE, East Lansing, Mich. June 25–August 2
Medical Biology
Bacteriology
Hygiene

UNIVERSITY OF MISSOURI, Columbia, Mo. June 10–August 2
Physical Education
Nursing

UNIVERSITY OF NEW MEXICO, Albuquerque, N. M. June 3–July 27
The Elements of School Health
Educational Hygiene

NEW YORK UNIVERSITY, New York, N. Y. July 1–August 9
Child Hygiene
Principles of Teaching Health
Methods of Teaching Health

NORTHWESTERN UNIVERSITY, Evanston, Ill. June 24–August 17
Personal Hygiene

OHIO STATE UNIVERSITY, Columbus, O.
June 18–July 24 (First Term)
July 25–August 30 (Second Term)
Child Health
Elementary Nursing
Principles of Public Health Nursing
Public Health Nursing Field Work

OREGON STATE AGRICULTURAL SCHOOL, Corvallis, Ore. June 17–July 26
Health Education
Nutrition
Child Care Laboratory
Physical Education
School Health Problems
Mental Hygiene
Social Hygiene Education

UNIVERSITY OF PENNSYLVANIA, Philadelphia, Pa. July 1–August 10
Hygiene
Physical Education

PENNSYLVANIA SCHOOL OF SOCIAL AND HEALTH WORK, Philadelphia, Pa. June 24–August 2
Public Health Nursing
Social Problems
Nutrition
School Nursing

UNIVERSITY OF ROCHESTER, Rochester, N. Y. June 26–August 2
General Physiology
Methods in Health Education
Methods in Health Activities

RUTGERS UNIVERSITY, New Bruswick, N. J. June 24–August 2
Public Health
Preventive Medicine
First Aid

STANFORD UNIVERSITY, Stanford University, Calif. June 20–August 31
Public Health Nursing
Health Department Administration.
Physical Education and Hygiene

SYRACUSE UNIVERSITY, Syracuse, N. Y. July 2–August 9
Hygiene

UNIVERSITY OF TEXAS, Austin, Tex. June 4–July 15
Child Care and Training
Elementary Health Education

UNIVERSITY OF VIRGINIA, University, Va.
June 17–July 27 (First Term)
July 29–August 30 (Second Term)
Hygiene and Sanitation
Sex Character Education
Biochemistry
Bacteriology
Physical Education

UNIVERSITY OF WASHINGTON, Seattle, Wash.
June 19–July 25 (First Term)
July 26–August 29 (Second Term)
Principles of Physical Education
Physical Education Administration
Nutrition
Bacteriology
Principles of Public Health Nursing and Administration
The Health Education Movement

WESTERN RESERVE UNIVERSITY, Cleveland, O., School of Applied Social Sciences. June 24–August 2
Hygiene and Preventive Medicine
Materials and Methods of Health Education
Graduate Seminar in Supervision
Mental Hygiene
Practical Social Problems of Cities
Social Pathology

UNIVERSITY OF WEST VIRGINIA, Morgantown, W. Va. June 7–July 29
Hygiene and Sanitation

UNIVERSITY OF WISCONSIN, Madison, Wis. July 1–August 9
Junior Red Cross and First Aid to the Injured
Tests and Measurements in Physical Education
Supervision and Organization of Health Education
Bacteriology
Public Health

RADIO PROGRAMS ON UNIVERSAL SAFETY

THE National Broadcasting Company, in coöperation with the National Safety Council, is giving a series of weekly radio addresses by national leaders on "Universal Safety." The purpose of this program is to awaken the American people from an attitude of seeming indifference toward the problem of the national accident fatality toll, numbering nearly 100,000 lives annually. Charles M. Schwab gave the first address, "Safety as a Factor in Industry," on April 20.

NEW ENGLAND HEALTH INSTITUTE

THE seventh annual New England Health Institute, a school of public health open to all public health workers and those interested in public health, was held in Hartford, Conn., the week of April 22–26, 1929. The Institute was sponsored by the U. S. Public Health Service, the Medical Schools of Harvard and Yale Universities, New England colleges, and state departments of health. The program of 84 lectures on the outstanding phases of public health was given by experts in their

respective fields. The fiftieth anniversary of the Connecticut State Department of Health was celebrated by a banquet at which the speakers were: Hon. John H. Trumbull, Governor of Connecticut, Dr. Edward K. Root, Dr. Hugh S. Cumming, Surgeon-General, and Dr. George E. Vincent, President, Rockefeller Foundation.

NEW MIDWESTERN FOOD OFFICIAL

JAMES O. Clarke has been appointed to succeed E. H. Goodnow, resigned, as chief of the Central District of the Food, Drug and Insecticide Administration. Mr. Clarke will direct the work of enforcing the food and drugs act and five other regulatory acts throughout the middle western district from his headquarters at Chicago.

Mr. Clarke has been in the service of the Department of Agriculture since 1917; first in the capacity of a chemist, having previously gained considerable experience in food analysis as assistant to the state chemist of Georgia. For six years he was chief of the station at Savannah, Ga., and in 1926 became chief of the New York station of the Eastern District of the Food, Drug and Insecticide Administration.

THE DIPLOMATE—A NEW PUBLICATION

THE first issue of a new medical periodical, *The Diplomate*, appeared April 3. This magazine is intended primarily for medical students, hospital internes and premedical students, and aims to keep them in touch with medical news and developments, especially in regard to medical colleges, preventive medicine and public health, the state licensing boards and the organized medical profession.

REMINGTON MEDAL AWARD

DR. Wilbur L. Scoville, chief of the analytical department of Parke, Davis & Co., has been awarded the Remington Medal by the American Pharmaceutical Association. The medal was awarded for "distinguished service to pharmacy," as chairman of the National Formulary Committee.

SPECIAL CHILD HEALTH TOUR

IN connection with the meeting of the Health Section of the World Federation of Education Associations in Geneva, Switzerland, next summer, a special tour for the study of child health activities in Europe is being arranged. This tour is for people professionally interested in child health, particularly school health. The dates of the tour are June 29 to September 1. Persons interested in joining this group should write to Professor C. E. Turner, Massachusetts Institute of Technology, Cambridge, Mass., who is chairman of the Health Section of the W. F. E. A.

EAR, NOSE AND THROAT STUDY

THERE will be an Ear, Nose and Throat Course, for American physicians only, at the University of Bordeaux, France, commencing July 22, 1929.

Dr. Leon Felderman, Philadelphia, Pa., is in charge of registering the American physicians.

HEALTH SCOUTS IN PALESTINE SCHOOLS

SCHOOL children in Palestine have been organized as sanitary inspectors to help raise the country's standard of public health. Their tasks are to safeguard the hygienic and sanitary conditions in the schools; help the school nurse in her teaching of hygiene; and to influence the homes in accordance with modern scientific regulations taught them by the department of hygiene. The health scouts visit dairies and food shops, submitting reports to the department.

PERSONALS

JESSE L. MEGARGEL, of the Hammonton, N. J., Board of Health, has been awarded the Anderson Memorial Gold Medal for distinguished services to the community along the lines of diphtheria prevention.

DR. JOHN J. SIPPY was elected president of the Northern California Public Health Association, succeeding Dr. William C. Hassler.

DR. B. S. STEPHENSON, Health Commissioner of Shelby County and Sidney, O., will attend the International Health Conference at Zurich in May.

DR. OLIVER KAMM, chief of the Chemical Research Division of Parke, Davis & Co., was elected president of the Michigan Academy of Science, Arts and Letters at its annual meeting held at the University of Michigan, Ann Arbor, during the third week in March.

DR. HUGH CARTER, of the Department of Sociology, University of Pennsylvania, has joined the staff of the Committee on the Cost of Medical Care, Washington, D. C. Dr. Carter has just completed a statistical study of Public Poor Relief in Pennsylvania since 1875 for the Commonwealth Fund and the Public Charities Association of Pennsylvania.

DR. DAVID KELLOCK, Health Officer of Harrisville, N. Y., died March 9 after a brief illness.

DR. AUGUSTUS MAYER, health officer of the town of Delaware, Sullivan Co., N. Y., died March 4.

DR. CALVIN L. COOPER has been appointed Health Officer of Kansas City, Mo., to succeed Dr. Porter E. Williams. His appointment will go into effect May 1.

DR. GEORGE F. REDDISH (Referee on Disinfectants of the Committee on Standard Methods of the A. P. H. A.), formerly Senior Bacteriologist in the Food, Drug and Insecticide Administration, Department of Agriculture, Washington, D. C., is now with the Lambert Pharmacal Co., St. Louis, Mo., as their chief bacteriologist.

DR. REGINALD J. H. STROUD was appointed State Superintendent of Public Health of Arizona by Governor Phillips.

ETHEL GROSSCUP is secretary of health instruction, Committee on Tuberculosis and Public Health, S. C. A. A., New York, N. Y.

CONFERENCES

May 7–8, Association of American Physicians, Atlantic City, N. J.

May 5–10, First International Congress of Mental Hygiene, Washington, D. C.

May 13–15, American Proctologic Society, Detroit, Mich.

May 14–17, American Psychiatric Association, Atlanta, Ga.

May 27–31, National Tuberculosis Association, Atlantic City, N. J.

June 13, International Hospital Congress, Atlantic City, N. J.

June 17–21, Annual Convention, American Hospital Association, Atlantic City, N. J.

June 24–28, American Water Works Association, Toronto, Can.

June 26–July 3, National Conference of Social Work, San Francisco, Calif.

July 8–13, International Council of Nurses, Montreal, Can.

July 9, American Heart Association, Scientific Session, Portland, Ore.

FOREIGN

May 15–20, International Congress of Public Health, Zurich, Switzerland.

July 13–20, Fortieth Congress and Exhibition of the Royal Sanitary Institute, Sheffield, England.

July 17–August 13, Third Vienna Summer School, University of Vienna, Austria.

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